

37727-38134

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200

RECORD

F. R. Fosberg

[Faint, illegible text on a yellowed page, likely bleed-through from the reverse side.]

Collection and Field Note Book

No. 46

(June 25, 1956 -- Aug. 6, 1956)

(37727 -- 38134)

RYUKYU ISLANDS

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changes in names of Ryukyuan plants

✓ 37224 *Pteris* *semipinnata* var. *dispar* (Kunze) Baker

✓ 37366 " " " "

✓ 37227 *Pteris* *ryukyuensis* Tagawa.

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ISHIGAKI ISLAND.

1

3

~~June 25~~ June 25 - just above
Waterworks

Patch of *Acacia confusa*
plantation with little
undergrowth, dense
canopy.

Clump of a small
bamboo. Formed a
dense clump, with
very short runners
coming out from it.

June 25 - intersection
of coast road with
road to Nagura.

Patch of woods.
On outer edge appears to
be mainly *Ficus*, 2 spp.
with some *Clerodendrum*,
Calophyllum, *Bischoffia*,
and a border of *Lewisaena*.

Small dark area on
photo is a thicket of
clumps of bamboo
about 3-4 m. tall,
canes arching,
bases of clumps
up to 1 m. diam.
spaced about 2 m. apart.
Canopy complete
ground cover of *Aplismenia*

(170-178 m
photo 940-32)

170

and a creeping piperaceous vine.

One haben seen here and collected. Curled up at the base of a bamboo clump, color blended very well with that of ground.

- 171 An area of *Leucaena* pure stand, essentially, about 6-8 m. tall, stems all sizes up to 5 cm. thick. Spaced 1 m. or less apart. No undergrowth or ground cover except *Leucaena* seedlings.

- 172 Clearing overgrown with *Imperata*, scattered pine saplings, one *Acacia* bushes, and many *Leucaena* saplings. *Ipomoea indica* and *I. littoralis*.

- 173 Secondary thicket of saplings of *Clerodendrum*, *Ficus* (cordate lfd. sp.), *Macaranga*, *Trema*, etc. a few larger trees of *Trema* and a large lfd. sp. of *Ficus*. *Oplismenus*, etc. on ground.

- 174 On escarpment overlooking marsh the thicket is larger, more mixed of *Ficus*, *Hibiscus*, *Melia*, *Pipturus*, *Pandanus*, *Mallotus*, *Macaranga*, *Cerbera*, *Clerodendrum*, etc. Locally patches of *Leucaena*, even more locally, *arenga*.

June 25

(175)

very weedy fallow field
has almost a solid
growth of:

- a *Paspalum conjugatum*
- a *Digitaria* sp.
- c *Commelina diffusa*
- c *Gynura*
- o *Ageratum conyzoides*
- c *Cyperus* 2 spp.
- o *Pimbristylis*
- a *Conyza canadensis*.

adjacent abandoned area
has a 1-1.5 m. growth
of *Mallotus*, *Clerodendrum*,
Lambucus, *Solanum*,
nigrum, *Setaria palmifolia*,
Rubus sp. *Boehmeria* sp.

(176)

secondary forest
adjacent:

- a *Mallotus*.
- o *Ficus*
- f *Clerodendrum*
- f *Macaranga*
- c *Trema*
- a *Podocarpus*

farther in

is locally some *Acacia*,
Melia etc. *Melanolepis*,
largest trees are *Trema*.
General canopy at
about 6-8 m.
most trees about 5 cm.
dbh. some up to 10.
Some undergrowth of
Maesa, ferns,
Alocasia, *Mallotus*
seedling (very spindly)
occasional very spindly
Miscanthus.

spacing of trees 1-3 m.
where they are larger
the spacing is wide,
smaller, close.

(177)

Up the slope are newly
cleared areas

(178)

in a taller secondary(?)
forest on post-Miocene
limestone.

This forest is up to 10 m
tall, dense has several
spp. of *Ficus*, *Macaranga*,
Melia, *Bischofia*, *Ardisia*,
Melanolepis, *Diospyros*
tangled with *Flagellaria*
and *Sporobolus*, *Smilax*, *Casuarina*.
Undergrowth of *Psychotria*, *Alocasia*,
Piper on ground.

The weeds in the newest clearings are *Gynura*, *Solanum nigrum*, *Molothrus*, *Sporobolus indicus*, etc. *Sesamum* is planted on the newest one, not much of a crop.

There are ~~3 or 4~~ 3 or 4 post-miocene terraces here, cut by a deep ravine. The surfaces are not especially rough except locally. One deep sink hole or collapsed cavern was noticed.

June 25 just above waterfalls, south of Maishi Take

37727 (bamboo) *Bambusa multiplex* (Fr. & Savat.) Makino
one clump on sloping ground
at edge of acacia plantation

June 25 ~~just~~ east of Kendo Beach,
lower northern ~~slope~~ of Maishi Take
Uso Dake

179
(Photo
940-7)

June 25 - 1 km. s. of Mase-take
a patch of "rock pasture"
land with rough limestone
protruding through the
surface of the soil.
The vegetation is thick
grass, mostly *Imperata*,
and a few scattered bushes.

det F. A.
McClure
60 m.

dense clump with
short runners formed
by downward curving
branches, ending in
erect culms up to 4 m. tall,
green.

60
25-60 m.

The weeds in the clearing
are largely *Ipomoea*,

25-60

- 37778 *Momordica*
growing in dooryard
- 5 29 *Mallotus japonicus* M.-A.
dominant in second growth
forest on low ground.
- 5 30 *Thesma orientalis* (L.) Bl.
scattered in second-growth
forest
- 1 31 *Psychotria linkianensis* Hatusuma ?
occasional
- 3 32 ~~Loxostylis~~ *Nerulia araxoana* Gand. det L.A. *garay*
small colony in forest
on level ground.
- 1 33 *Youngia japonica* (L.) DC. *OK*
rare in new clearing
on rough limestone boulder

June 25 - just east of
Kido Beach, ~~north~~ n.w. of
Maishi Take
in old field with grass
and bushes.

- 6 34 *Leucaena glauca* (L.) Benth.
common, dominant in
surrounding thickets.

prostrate, flowers yellow,
fruit extremely warty,
used as food. "to nigauli" (?)
small tree 4 m. tall.

tree 6 m. tall, fruit
dark purple when ripe.

3 shrub 1 m. tall, ripe
fruit size and
appearance of a small
red cherry.

3 erect, sheaths bronze
purple; flowers light
green with whitish
lip with dark purple
veins. corolla depressed
globose, white, firm fleshy.
flowers yellow.

34 shrub 2 m. tall (others
to 6 m.) flowers white
turning salmon color.

37735

5

Ipomoea indica
common

5

36

Ipomoea littoralis
common

5

37

(Cucurbit.) *Trichosanthes dioecia* Vahl
in thickets

Twining over bushes,
extensive; flowers light
blue.

twining over bushes;
flowers rose pink, ~~on~~
maroon in throat.

extensive vine, climbing
over small trees;
flowers white on
erect inflorescences,
falling when touched,
corolla lobes conspicuously
fimbriate.

June 26 - Kobama + Shima
from boat passing to south
and east

The island is ~~one~~ of
rather low relief, with
one hill rising to a little
less than 100 m. It is generally
grassy on the ~~south~~ ^{northwest} side.

~~There~~ a patch of wood about
in the center, several small
bits of wood ~~at~~ on the
terrace around the hill,
and scattered trees on
the ~~southwest~~ ^{east} plateau.

From a distance the grass
looks like Imperata, judging
by the color.

Sand bar a couple of
miles east has a
clump of bushes which
has accumulated a
small dune.

Several rocks, of chert?,
in this area, have no
vegetation visible from
about 1 km. north.

On northeast side of
Kobama the bluffs and
rough places seem to
have some sparse scrub
as well as grass. Littoral
forest a scrub back of beach in
central part.

The small flattish
island north of Kobama,
"Rabbit Island"

is entirely grass covered
except a small clump of
trees or large bushes in
the center at the top of
the low knoll and some
littoral scrub at the
east end. It is surrounded
by low cliffs.

Northwest end of Kobama
is quite brushy

June 24 Iriomote Jima

The ~~south~~^{east} and ~~east~~^{north} coasts are very abrupt and generally wooded.

Along the ~~eastern~~^{northern} part of the ~~south~~^{east} coast are many truncated spurs with sloping terraces at their bases. Many of these spur faces and terraces are grassy, giving a pattern of irregularly triangular light green scallops, points up, against the dark green background of the wooded mountains.

Handslide scars are numerous and in various stages in revegetation. There is no question but that these provide a chronologically continuous series of habitats on an island like this which, otherwise, before man, would have provided no open upland sites.

There seem to be large areas of bamboo on the tops and upper slopes of some of the high mountains, especially those on the ~~so~~ north east corner.

Below along the north coast near the east end is a flattish park-like terrace with grass and scattered trees. Headlands are wooded or scrub-covered. The scattered trees on the terrace are mostly pine. The headlands are rounded domes of limestone with smooth cliffs around them.

Several large deep valleys. These seem to have larger trees and more uneven canopy than the ridges and general topography, where the canopy seems smoother and finer textured.

Toward the center are some black sandstone(?) cliffs at high altitudes, with apparently caves in them.

Scattered all along the north coast are patches of the park-like terrace with pines mentioned above. These have wooded ravines.

A large bay has a fine vertical waterfall at the head of one of its valleys. On the ~~west~~ ^{both} sides of this bay are many undercut limestone remnants. Some of these are on a small island in the mouth of the bay. They are very rough and covered by pandanus scrub in large part.

The village of Funaura is on the west side.

Trees in village are *Hernandia*, *Hibiscus*, *Albizia*, *Heritiera littoralis*.

The country back of Funaura toward Uhauchi is covered by *Imperata* with scattered pines, locally clumps of *Cycas* and *Pandanus*. Some spots wooded with a few

patches of sugarcane. On higher ground a few patches of sweet potatoes and dry rice. Hills round about wooded.

Beach ridge along coast covered by a littoral forest of *Hibiscus*, *Pandanus*, *Guettarda*, *Pipturus*, *Pouteria*, *Hernandia*, *Scaevola*, *Allophylus*, even *Garcinia*, *Bischoffia*. Back of it is a depression with *Imperata*, *Artemisia* and weeds.

Back of this low hill, with a mixture of *Imperata* and *Pandanus* thickets, scattered clumps of *Cycas* and occasional pine seedlings. Some patches of *Gleichenia*.

Scrubby forest back of this.

At Nozaki Bridge is a low flat between 2 streams. Part of it is in rice, part in thickets of *Excoecaria*, *Pandanus*, *Scaevola*, *Premna*, *Hibiscus*, *Cycas* on higher spots. A little mangrove on margins of estuary on west side.

June 26 - Hatoma & Shima
from boat passing
a couple of miles to
south

The island looks
generally flat and of
rather low elevation,
with a plateau-like
hill in the center. Villages
are conspicuous. The
island presents a wooded
appearance to the sea,
possibly mainly of
Acacia confusa and
Ficus. Probably the
Acacia at least is
mainly in hedges and
thickets planted around
fields, but this cannot
be seen from the sea.

After passing a small
village the road goes
over some low hills
of porous limestone
covered by thickets
in which *Ficus*, *Arenca*,
Pipturus, *Hibiscus*,
Erythrina, *Mussa*,
Macaranga, *Melanolepis*
are prominent, also *Melis*,
Broussonetia, *Pandanus*,
Mallotus, *Porteria*, *Albizia*
(p. 70)

June 26 Iriomote (ctd.)

This littoral forest extends in both directions from the bridge on a dune ridge. Westward this expands into a flat. Here is a clumpy version of the forest, clumps 3-4 m. high, spaces between them filled by *Imperata* and weeds.

Tetrapanax papyrifera local here, all stems plants up to 2 m. tall.

(# on 6.19 by car)

Between limestone outcrops are cultivated patches of sugar cane and sweet potatoes.

Going down from this another village is approached. Here an edge of a paddy field is eroded away, exposing a bed of shells - *Tridacna* etc. about 5 km down. Shells look well preserved. (Ueborn)

This village is on a low flat, largely in rice.

On the other side of this village are low sandstone hills covered by *Miscanthus* and scattered miscellaneous bushes, a few pines. Here is the coal mine.

This gives way to a few porous limestone hills with thickets. Then a line of sandstone cliffs back of a broad sandy flat. The cliffs have mixed broadleaf and pine forest on them, quite thick, with a few *Livistona* and *Myrsine*.

The sand flat has thickets of young *Casuarina*.

At Urauchi are spectacular cross-bedded sandstone cliffs and a pyramid in the mouth of the bay. Pines, *Pandanus* etc. on the cliffs but they are mostly bare.

On the other end of the sand flat are high undercut cliffs of limestone capped by thickets.

South of Urauchi the coastal hills are covered by an open growth of pines with low tangled vine-covered scrub and some grass between. Obviously at one time a pine savanna which, not being burned, is now growing up in second-growth between the pines.

June 24 - Lomai Point

West of landing there is pitted limestone, both as cliffs and huge boulders on the beach. On the cliffs the vegetation is largely *Pandanus*, *Ligustrum*, *Cycas*, *Diospyros*, *Hibiscus*, etc. On the rocks just at or above sea level is a special flora of *Limonium*, *Illecebrum*, *Hedyotis*, *Sedum*, *Zoysia*, ^{*Carmena*}, etc.

The rock changes, westward, abruptly to sandstone. The special flora disappears and is here not replaced.

The vegetation on the sandstone cliffs is not as luxuriant as on limestone, and is dominantly *Pandanus* and *Scaevola*. A number

of ferns; e.g. *Pteris*, *Sphenomeris*, *Adiantum*, and a large *Sedum* are found in the crevices, with a little *Hedyotis albidopunctata*, and *Fimbristylis cymosa*.

Cycas and *Diospyros* ^{persea} are occasional in the cliff scrub.

(Copied from other notebooks).

The flora of the saline limestone surface, *Illecebrum*?, *limonium*, *Carmena*, *Hedyotis*, *Zoysia*, *Sedum*, disappears abruptly when rocks turn to sandstone, partially reappears on a bit of limestone at the end of the point; then on soft sandstone, only *Hedyotis* and *Angelica* persist, the *Hedyotis* in small amounts. On the sandstone are several ferns, *Fimbristylis*, etc. that are not on limestone. *Ischaemum* on both. Large plants: *Pandanus*, *Cycas*, *Scaevola*, *Diospyros* on both.

Funaura
June 24 - n. of Funaura

beach forest on sand
ridge and flat

37738 *Rysimachia mauritiana* Lam.

2 in full sun on sand

2 39 *Loranthum batifera*

along road, in sun. *H. propinquum* (Kunt.) Hitchc. det. A. Chase

2 40 *Tetrapanax papyrifera* (Miq.) K. K.

in open area. *T. papyrifera*

2 41 *Carmona retusa*

occasional *Ehretia microphylla* Lam.

3 42 *Scaevola sericea* Vahl
very common

2 43 *Ligustrum japonicum* Thunb.
common

2 44 *Antidesma pentandrum* var. *barbatum* Merr.
occasional

June 26 Iorai

a. *Halodule uninervis* (Forsk.) Aschers. (narrow-leaved form)
b. *Halodule uninervis* (Forsk.) Aschers. + var. (a few leaves)
c. *Halophila ovalis* (L. Br.) H. Br. (2 very small plants)

45a abundant in shallow water
on sand bottom

4 46 *Begonia pinnatifida* (L.) Burdet & Hampe
on shaded very rough
limestone

2 47 *Sedum formosum* N. E. Br.
in crevice on sandstone cliff.

2 m.

38 flowers white.

40 shrubs about 2 m. tall,
sterile.

41 ascending shrub,
flowers white, ripe fruit
orange-red.

42 shrub 1.5 m. tall, flowers white,
fruit white (calyx lobes
not especially variable,
flowers vary from white
to somewhat purplish).

43 shrub 3 m. tall, fruit
immature.

44 shrub 2 m. tall;
immature fruit eaten,
pleasantly acid.

leaved form) det. C. den Hartog 1969 (all these plants are
0 m. sterile, rhizome buried.

20 m. 46 leaves fleshy, flowers
white.

5 m. 47 dried fruiting plant only.

- 37748 *Genostegia hirta* (Bl.) Mez.
common on sun weathered
sandstone
- 3 49 *Sphenomeria chinensis* (L.) Maxon
crevices in sandstone cliffs
- 3 50 *Pteris fauriei* Hieron. (atyp. form)
crevices sheltered crevices
in sandstone cliffs.
- 5 51 *Pandanus tectorius* var. *luteus* Hance
abundant, generally, on
sandstone cliffs.
- 2 52 *Fimbristylis cynosuroides* (L.) R. Br.
rare in crevice on top
sandstone cliff
- 2 53 *Hedyotis*
occasional in crevice
on sandstone cliff
- 3 54 *Pittosporum tobira* (Willd.) Ait.
common on limestone cliff
- 5 55 *Diospyros ferrea* var. *lanceolata* (Rottb.)
common on limestone cliff.
- 2 56 ~~*Angelica*~~ *Paeostegium japonicum* Thunb.
common on rough limestone just
above sea level.
- 2 57 *Hedyotis* *Oldenlandia cuneifolia* A. DC. ?
abundant common on rough
limestone just above high tide level
- 3 58 ~~*Illecebrum*~~ *Philoxerus wrightii* Hook. f.
abundant on rough pitted
limestone just at or about
high tide level.
- 2 59 *Limonium arbusculum* (Maxon.) Makino
common on rough limestone
just above high tide level

2-5 m.



branched herb.

shrubby tree 3 m. tall.
fruit head subglobose,
basal fleshy part of
phalanges swollen,
ripe fruit orange red.
caespitose

53 prostrate, fleshy, flowers
white.

5 m. 54 shrub, fruit immature

Pachira 5 shrub; fruit yellow.
5 m.

3 m.
just above sea level.
2 m.

1 m. 5 prostrate, fleshy, matted;
flowers pink.

1 m. 5 dwarf shrub, compact;
flowers lavender.

- 37740 *Sedum uniflorum* H. & A.
 1 rare on rocks ~~just~~ above
 high tide level.

June 26 - Shiraibama
 common on weathered
 sandstone banks.

- 2 61 ~~Andropogon~~ *Pogonatherum crinitum* (Thunb.) Kunth
 2 62 *Lycopodium cernuum* L.

Haha
 June 27 - ~~Haha~~ Banare + Shima
 on beach ridge along
 inner beach

- 63 ~~Calliandra~~ *Calliandra japonica* var. *lanceolata*
 inner edge of beach scrub
 64 opening in beach scrub

Beach scrub here mixed,
 1.5 - 3 m. tall, dense.

- f *Scaevola sericea*
- f *Messerschmidia argentea*
- f *Hibiscus tiliaceus*
- c *Clerodendrum inerme*
- c *Pitrosporum tobira*
- f *Miscanthus floridulus*
- o *Diospyros ferrea*
- o *Calliandra*
- c *Premna obtusifolia*
- f *Pandanus*
- o *Porteria*
- o *Guettarda speciosa*

2 m.

20 m.

det. H. & A. chart
 61 tufted.

62 Creeping, with erect
 fruiting stems.

2 m.

det. H. & A.

det. H. & A.

det. H. & A.

63 shrub 1 m. tall.

flowers lavender.

64 leaves subcoriaceous;
 flowers lavender.

June 27 - Shirahama
 Around Shirahama
 the lower hills are
 partially cleared and
 in *Imperata* with scattered
 pines.

The forest here is
 quite moist. Ferns
 are ~~so~~ abundant.

Fragaria is found down
 to a low altitude.

June 27 - Nakara * Gawa
 trip up by small boat
 This is a drowned valley.
 The entrance is between
 bluffs of sandstone
 10-15 m. high, on the
 north side wooded down
 to the water, on south side
 the lower cliffs are bare.
 Pines are left behind
 at the entrance and the
 only dominantly non-woody
 vegetation from there on
~~is~~ occurs on landslide scars
 and several small rice
 patches in mouths of
 small ravines just above
 valley mouth.

0.5 km or so up the river
 extensive low mangroves
 start on the south side.

Up a little it shifts
 to north side. Seems to be
 on concave sides of
 curves and in indentations.

The forest on the bluffs
 seems rather scrubby.
 Ferns are conspicuous.

The forest of the
 main slopes seems to
 be largely of *Quercus*
cuspidata, so far as can
 be made out from the
 boat.

The mangrove up a mile or so is largely *Burquiera* some *Rhizophora* and *Sonneratia racemosa*. A small clearing here on left (north) bank.

Above this the river narrows, the mangrove ~~forest~~ diminishes to narrow bands along the banks, *Rhizophora* drops out, ferns become more noticeable on the cliffs.

Above this the river forks and at the fork is an extensive mangrove swamp. The mangrove in this whole area does not seem to be more than 2-3 m. tall; ^{above high tide} is taller up-river than at the mouth.

Another mile or more up the mangrove becomes more and more replaced by *Pandanus thicket* of about the same stature. Both mangrove and *Pandanus* here become 4-5 m. tall.

The river meanders through broad flats in the left fork of the valley. These flats are 1-2 m. above high tide. On higher spots the *Pandanus*

is mixed somewhat with *Prosopis ferea* some *Barringtonia racemosa*, *Rhus*, *Mallotus*, *Bischoffia*, *Macaranga*, *Arundo donax*, *Hibiscus tiliaceus*.

A few rice patches scattered along this flat. *Burquiera* and *Sonneratia* still common well up the river, but other more mesophytic trees become more and more common. Also a small bamboo. More rice patches till most of flat is covered by them.

The steep slopes and mountainsides above continue to be densely forested, probably largely with oak. Where the meanders approach the cliffs the oak comes down to the water. The forest is festooned with great tangles of *Freycinetia*. Ferns are very luxuriant. Mangroves finally drop out, well above the limit of brackish water.

Barringtonia becomes common, Fraxinus, Xylocarpus, bambos, Eugenia jambon, Ficus.

The flat becomes quite narrow and the vegetation more luxuriant.

Finally, at head of navigation flat disappears

Helen Foster went to top of the high hill behind Shirahama. Forest here mainly Quercus cuspidata, as far as large trees are concerned, but nothing larger than 20 cm. dbh and 10 m. tall.

Second story of smaller trees dense enough to shade out most undergrowth. Soil a thin yellow sand with almost no humus.

Miscanthus seems to come in first when land is opened up. Gleichenia comes in on landslide scars or where soil is eroded away. Apparently repeated disturbance and burning favors Imperata. Pine is found only in coastal areas and probably is a good indicator of past disturbance.

Mr. Toyama
of YAP says
most
oak over
20 cm dbh
are not
round.
in this
district.

even where growing in mixed forest now.

Yaka-banau-shima is pretty well denuded on seaward side. Horned Cyces and Pandanus thickets on upper slopes, Imperata between. A line of vertical cliffs, nearly bare. Talus below thickly grown with a mixture of Miscanthus, Pandanus.

Outer part of south side about bare except for a patch of scrubby wood on talus. Inner part with many pines.

and on cliff above on one corner. In this on a completely inaccessible cliff top is a clump of Livistona.

Cycas absent on westernmost slopes and cliffs, which have mainly Miscanthus.

June 27 ~~Funaki~~ Funanki
Hills here are wooded
to base, lower slopes
rather disturbed, with
some pine, some *Miscanthus*
Sivistonia on bluffs, tops
of lowest hills covered
by pine groves.

Trees in town are
Garcinia, *Calophyllum*,
Ficus, *Morus*, *Casuarina*,
Citrus.

Funanki bay has
slopes coming almost
to water, wooded all the
way. Scarcely any bare
cliffs, except on Uchi-banaru
shima.

Uchi-banaru shima
shows various stages
in degradation of vegetation
from thickets with pines
through *Miscanthus*
with pine, *Imperata*
with pine, *Imperata*
without pine, progressively
toward outer headland.

Beyond Funanki the
headlands and spurs tend to
be grassy. Scattered pines
on these and also in thicket
behind them.

June 27 Amatori

Surrounding hills
are grassy, with
scattered pines high
on slopes, clumps of
Cyperus on lower slopes.

No real forest within
almost 1 km of village.

Village lives by cutting
wood. Many trees
around village - *Hernandia*,
Hibiscus tiliaceus, *Porteria*,
Pandanus, *Messerschmidia*,
Terminalia catappa, *Casuarina*,
Ficus, *Morus*, *Garcinia*.
Beach ridge with
beach scrub extending
eastward from village.

Immediately back of
village some steeper
bluffs have thickets
of *Pandanus* and various
bushy trees, *Garcinia*,
Pine, *Sivistonia*, much
Miscanthus.

Between these bluffs
and village a belt of
paddy fields, one patch
of *Nelumbo*. Some small
reed brakes - *Phragmites karka*.

JP

Village streets lined with rows of tall *garumia*. Several tall *Livistona*.

Broad beach has well developed belt of *Ipomoea pes-caprae*, *Vitex*, *Spinifer*, *Wedelia* *biflora* in front of beach scrub.

Some of the hills overlooking the shore on both sides of village have thickets of bamboo mixed with cycads and *Miscanthus*.

June 27 - The general pattern of the vegetation of this west coast of Iriomote seems to be dense rather low forest on the high mountain slopes, this predominantly of *Quercus cuspidata*. There is not especially dense undergrowth or luxuriance of ferns on the high slopes up to 200 m. at least. The trees are, in general, not large.

Nothing known of slopes higher than 200 m. except that from the sea they look the same. Landslide scars are common on the steep slopes, covered by *Gleichenia* or *Dipteris*.

The deep valleys have similar oak forest on their walls, but wetter and with masses of ferns and *Freyrinetia*. Steep slopes are often completely covered by large ferns.

The lower, tidal parts of the valleys, drained to a considerable depth, have *Pandanus*, *Barringtonia racemosa*, and other swamp species along the rivers, then flats appear covered by *Pandanus* thickets and mangrove, with paddy fields in suitable places. These flats give way to extensive mangrove swamps on the concave sides of meanders, with *Bruguiera*, *Rumitiza*, then increasing proportions

of Rhizophora. Excoecaria common generally along these river margins.

On the ridges, toward the sea the forest degenerates to thicket with scattered pine trees ^{or grove} ~~grove~~ ^{pine grove}.

This gives way to Miscanthus with pine, Pandanus thickets on steep places and in ravines, mixed with other things.

The headlands may have Imperata either with or without scattered pines. Some may have Miscanthus.

Flat bottoms of small valleys may have rice fields or

Imperata and thickets.

Beach ridges are characteristic across small valley mouths and have dense beach forest or scrub with

Hernandia, Scaevola, Portulaca, Hibiscus, Messerschmidia, Guettarda, Diospyros, Pandanus, Allophylus, Premna, etc. at the

top of the beach may be Ipomoea per-caprae, Vitis, Sphum, Thuarea, Ischaemum,

etc. making a belt that attenuates out down the beach.

Where there are limestone rocks along the shore or low rough limestone cliffs the scrub or scrub forest is thicker and richer in species than on sandstone.

It is dense and tangled, the abundance of Pandanus making it difficult and painful to traverse, this in addition to the dissected limestone or "foo" surface.

Along the rocks at about high tide mark or just above, on limestone rocks is a characteristic community of compact halophytic plants,

mainly Limonium, Hedysotis, Ilcebum (?), Ischaemum, Angelica, Carmona, Sedium, etc.

This is absent on similarly placed sandstone rocks.

The bottoms of the bays where 2 m. or less deep are covered more or less by acnoides and where exposed or almost at low tide, by other marine seed plants.

On sand
beach ridges
and sand
Cassipouera
is abundant

June 27 - ~~Hoka~~ Banare & Shima
in beach scrub on sand
ridge back of beach

- 37765 *Vitex trifolia* var. *simplicifolia* Cham.
2 common in edges of
3 66 *Scaevola sericea* Vahl
very common
2 67 *Allophylus limosus* (DC) Bl.
occasional

June 27 - Amatori
at top of beach

- 3 68 *Ipomoea gracilis* R. Br.
occasional
2 69 *Chrosodendrum inerme* (L.) Gaertn.
common at edge of scrub
2 70 *Thuarea involuta* (Forst.) R. & S.
on sand
2 71 *Wedelia biflora* (L.) DC.
very common
3 72 *Amaranthus pacificus* Desf.?
common at top of sea wall
where rubbish is thrown
2 73 *Amaranthus*
common at top of sea wall
where rubbish is thrown
2 74 *Lambucus*
common in shade of beach
forest.
2 74a *Euphorbia* ~~at~~ *chamissoi* Boiss.
E. atala E. Forst.

2 m.

- almost prostrate;
flowers violet.
shrub 1 m. tall;
flowers white.
shrub 1 m. tall,
flowers white.

1-2 m.

- 68 prostrate on sand; flowers
rose purple maroon center.
low shrub, flowers white.
prostrate, flowering
branches erect.
prostrate, flowers
yellow.
much branched herb.
branched herb.

- herb or weak shrub
1 m. tall, flowers white,
large glands yellow.

1956 Ryukyu Is.

June 27 - Funauki

in waste places and
edges of rice patches37775 *Eragrostis amabilis* W. & A.
common1 76 *Cyperus compressus* L. " "
occasional2 77 *Cyperus polystachyon* R. & B.
occasional3 78 *Cyperus javanicus* Houtt. ^{OK} ^{5 H} ^{Herbar}
common3 79 *Ranunculus sieboldii* Miq.
common in damp places1 80 *Morus australis* Forst. var.
planted along village
street back of sea wallJune 27 - ~~the~~ near head of
tidal influence on Nakara-Gawa
just above5 81 *Rhododendron*
occasional2 82 (Melast.) *Tachiroea yauyacuensis* Matsum.
occasional3 83 *Mallotus japonicus* M. & A.
commonMay 27 Shirahama
around dwellings4 84 *Euphorbia thymifolia* L. " "2 85 *Euphorbia prostrata* Riv. " "

2 m.

10 A. 10.00

78 caespitose, leaves gray-green

77 prostrate; flowers yellow

80 tree 5 m. tall.

1 m.

81 shrub 1.5 m. tall, flowers
a beautiful flame-crimson.

82 low shrub, flowers pink.

83 small tree or shrub 3 m.
tall & staminate & fruiting plant
with capsules ~~scar~~ with
soft processes - not collected

2 m.

84 prostrate
85 prostrate, purple

Hoba
June 23 ~~Hoba~~ Banane Shima
on beach ridge on inner
side of island

- 37786 *Spernoea per-capasa* (L.) Sweet
uncommon here
- 87 *Melanolepis multiflorulosa*
Mollisia moluccana (L.) M. & A.
common in scrub
- 88 *Youngia japonica* (L.) DC.
rare in shaded paths
- 89 *Digitaria sanguinalis* (L.) Scop.
common inside
- 90 *Phyllanthus*
Baccharis
rare in scrub
- 91 *Spinifex littoreus* (Burm.) Merr.
common at top of beach
- 92 *Messerschmidia argentea* (L.f.)
common in scrub
- 93 *Lesuvium portulacastrum*
common at top of beach
- 94 *Chenopodium acuminatum* Willd.
common on beach
- 95 *Hibiscus tiliaceus*
Thapsia papilion
common in scrub
- 96 *Pouteria*
Litsea japonica (Thunb.) Michel
common in scrub
- 97 *Sonchus oleraceus* L.
rare along path
- 98 *Artemisia capillaris* Thunb.
common in shade
- 99 *Cinnam asiaticum*
common at top of beach

1-2 m.

prostrate creeper,
flower bright rose purple,
shrub 2 m. tall.

flowers yellow.

A. close

shrub 1 m. tall; flowers
yellow.

A. close

forming large
loose mats, blue-green.

Johnst.

shrub 2 m. tall,
leaves fleshy, silvery
green, fruits fleshy.
loose mat half
buried by sand; flowers pink.

shrub 3 m. tall; flowers
yellow with maroon
centers and stigmas.
small tree, 4 m. tall.

flowers yellow

much branched weak
sprawling herb; flowers yellowish.
scapes axillary in
rosettes, 1 m. or less tall; flowers
very frequent perianth white, filament and
style maroon purple.

June 29 - north of Ozata
just n.e. of Kara Lake
scrubby forest on
Eocene limestone, much
dissected large knob.

(179)
(photo 950-4)
Forest is dominantly
Ficus spp., *Diospyros*
granitina, *Ardisia*,
Pandanus, *Arenca*,
some *Croton* and rhinops
in undergrowth.
Some *Diospyros* *persea*.
Ferns present but not
common. Small
green bamboo common.
Hododalia and another
spiny vine, also
Cassalpinia.

(180)
Pasture nearby on
schist ~~is~~ and a low
ridge of tuff beds
dipping under Eocene
limestone has *Imperata*
with some *Andropogon*,
Evolvulus, *Wahlenbergia* (2),
Blumea spp., *Vernonia*
cineria, *Osteckia*,
Lygodium, *Setaria*,
Psidium, etc.

June 29 - Tozato
left hand Eocene limestone
knob - wooded with
a scrubby forest, sparse
at top, dense at base
dominantly *Ficus* spp.,
Machilus, *Diospyros*
granitina, *Capshilepis*,
Rhus, *Ardisia*, *Garcinia*,
Melanolepis, etc.

a solid mass of *Arenca*
in undergrowth -
up to 4 m. high, also
much *Alocasia*.
Forest to 6-8 m., canopy
uneven.

A few ferns, *Piper*
covering rocks very
sparsely. Some *Euphorbia*
and *Hoya*.

Limestone is dissected
and jointed into
huge blocks, not too
rough a surface.

(182)
Weedy field at base with:
Bidens pilosa
Solanum nigrum
Synedrella nodiflora
Paspalum conjugatum
Digitaria sp.
Imperata cylindrica
Sida
Ageratum conyzoides

1956 Ryukyu 9.2.58

Gynura

*Coryza canadensis**Xanthium**Portulaca oleracea*183
(photo
950-103)

Knob of Eocene limestone
back of large one on
right.
Densely covered by
forest of *Ficus retusa*,
Diospyros maritima,
Pouteria, *Mallotus moluccae*,
undergrowth of *Arenca*
Fraxinus, with *Pisonia aculeata*,
Epipremnum, *Flagellaria*,
Paya, *Pueraria*,
Piper, and other vines
abundantly tangled
in it. *Nephrolepis* and
Asplenium nidus common
at base *Pisonia umbellata*

184

In the saddle between
this and the larger peak
the forest is mostly
Pisonia umbellata
with *Pipturus*, *Boehmeria*,
etc. *Arenca* vines.
Asplenium on ground.

185

The forest on the larger
knob is more luxuriant,
richer in species.
Has *Pouteria*, *Garcinia*,
one more sp. of *Ficus*,
Hibiscus tiliaceus,
in addition *Fraxinus*
common. Vines abundant.

~~Gymna~~
~~Chrys~~
~~Xanthium~~
~~Lysimachia~~
~~Portulaca oleracea~~

Ficus retusa dominant
 on top ridge.

The limestone is
 dissected into pinnacles.
Nephrolepis and *Asplenium*
nidus abundant on top.

Shirayuki

June 29 - ~~Tozato~~ ^{back of} Hoshino, Tozato Distr.
 on hills of sharply
 dissected ~~hard~~ Eocene limestone,
 densely wooded.

37800
 2

~~*Pyramia*~~ *leucomorphum* *microphyllum*
~~climbing~~ on shaded vertical
 rock surfaces

100 m.

clinging close to rock;
 leaves fleshy.

3 01

~~(ficus)~~ *Bolbitis* *hidzumei* Tagawa
 on flat earth surface between

50 m.

rhizome scarcely buried;
 sterile.

5 02

Asplenium *nidus*, L.
 on bare shaded rock

150 m.

large rosette, collecting
 a mass of dead leaves
 in center.

3 03

Quercus ^{*glauca* Thunb.} *myagii* Koidz.?
 rare, near top of highest hill

150 m.

sterile tree 8 m. tall,
 leaves glaucous beneath.

5 04

Bridelia ?
 rare, near top of highest hill

150 m.

tree 8 m. tall; fruit immature.

5 05

~~*Samolax*~~ ^{*Heterosmilax* *japonica* Kuntze}
 occasional

100 m.

wine climbing in trees,
 fruit immature.

3 06

Piper ^{*hadoura* (climbing) Ohwi}
 very common on ~~ground~~
 and climbing on tree trunks
 and rocks.

50 m.

creeping and climbing
 vine, dark green; buds
 very young.

- 37307 *Pisonia umbellifera* (Forst.) Keem.
" common locally in
saddle and around base
of hills

- 2 08 ~~*Asplenium*~~ *Colysis wrightii* (Hook.) Ching
local on earth in saddle

- 6 09 *Stictocardia tiliaefolia* (Desf.) (Desf.) Hilleb.
tangled in thicket

- 5 10 *Peperomia*
common on rocks

- 5 11 *Microlepia strigosa* (Thunb.) Presl
rare

same - clearings
and thickets

- 1 12 (~~asanth.~~) *Ajuga elatior* Ohwi 11
rare in new clearing
from which dry rice had
been harvested.

- 1 13 ~~*Asplenium*~~ ? *Ichmanthus villosus* (F.M.)
in shade at edge of clearing
- 5 14 *Alpinia speciosa* (Wendl.) K. Schum.
edge of thicket

- 2 15 (*Colysis elliptica* (Thunb.) Ching)
~~*Asplenium*~~
common in damp thicket

50 m.

tree 7 m. tall, 15 cm. dbh.
with soft pulpy brittle
wood; flowers dull
white, stigma like
a smashed brush, slightly
oblique.

100 m.

rhizome scarcely buried,
fronds erect, fertile ones
arching.

50 m.

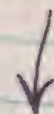
extensive vine

75 m.

fleshy, procumbent.

50 m.

50 m.



flowers white.

(Bailey) Merr.

OK A. 12. 1951

prostrate

canes 1 m. tall. flowers
waxy, white, stamens
orange with red veins.
fruit ribbed.

June 29 - just e. of
~~Kana dake~~ ^(1 km. e. of n.) south of Ozato
 rolling grassland

37816 ~~Andropogon~~ ^{(part) A. Caninus}
^{syn. bispinosus} common on knolls

17 ~~Pleioblastus~~
 common between
 limestone.

3 17 *Fraxinea umbellata* Rottb.
 in wet spot

3 18 *Hydrocotyle subthymoides* Lam.
 in damp spot

3 19 *Blumea lilacea* (Burm.) DC
 occasional on

5 20 *Blumea hirsuta* (Burm.) DC.
 common on

same - on deeply
 dissected hard Eocene
 limestone outcrop

✓ 21 *Pleioblastus*
 common between great
 boulders

5 22 *Cudrania cochinchinensis* var. *gerontogea* (L. & Z.) Masam.
 rare in forest

40-50 m.

↓

on
 A. d. d.

caespitosa
 (seeds sent to)

prostrate to ascending.

det. J. Randeria 1958

det. J. Randeria 1958

60 m.

↓

culms in small
 clumps from running
 rhizome; to 2 m. tall,
 green.

slender shrub 2.5 m.
 tall, lower sterile
 branches spiny, fruit
 starting to turn yellow.

June 70 1.4 km. n. of Ozata

(186)
(Photo
950-6)

Somewhat dissected alluvial terrace with medium Imperata grassland with an abundance of several species of *Scleria*, some *Blumea* (2 spp.), a little *Pteridium*, *Elephantopus mollis*, *Setaria*, *Arthraxon*, *Artemisia Desmodium* (?), *Erigeron*, *Fimbristylis*, *Ischaemum*, *Sporobolus*, very small *Oryza*, *Melastoma*, etc. *Rhynchospora rubra* probably has been burned within a couple of years. Across road has been burned more recently, is very sparse, with bare ground showing.

(187)

The surface of the bog is a thick mat of grass roots ^{and rhizomes}, apparently over a very soft material. Walking on it, its resistance varies from firm to soft in places yielding to knee-deep, or in the Pandanus, deeper.

One sump hole has somewhat open water and *Eleocharis*.

Grassy peat-bog occupying the head of a small dendritic ravine, the lower part of which is in rice.

This has a sparse stand of *Phragmites* rather locally distributed

Between ^{and in} these patches is a dense grass, with *Panicum repens*, *Poa*? *Leersia*, *Cyperus*?, *Fimbristylis*, *Centella*, *Eriocaulon*, *Thelypteris*, *Gegkylodius*, *Juncus*? *Oryza*, *Ischaemum*, *Polygonum*, *Polygonum* (large), *Ammannia*, *Phascolus*, patches of *Lygodium* ^{climber}, the whole about 1 m. high, very dense.

(188)

Locally areas of impenetrable *Pandanus* thicket with scattered *Glochidion* on very soupy mud. In the grass are horizontal *Pandanus* stems.

(189)

Surrounded on one side by grassy ridges

(190)

other side by secondary thicket with *Glochidion*, *Symplocos*?, *Raphiolepis*, *Malotus*, etc.

June 30 - 1.6 km. west of
Ozato, e. branch of upper
Miyara gawa
in grassy peat bog in
broad ravine

- 37872 *Eleocharis* ^{oil-sootadus Steud.}
local colony in hole
with open water
- 5 23 *Lygodium scandens* ^{var. *microphyllum* Nakag.}
local patches
- 5 24 *Leersia hexandra* ^{Sweet}
codominant grass
- 1 25 *Commelina*
rare
- 5 26 *Isachne* ^{*globosa* (Thunb.) Kunth}
abundant, forming lower story
- 1 27 *Polygonum* ^{*dichotomum* Bl.}
rare
- 2 28 *Cyperus* ^{*globosus* All.}
rare
- 2 29 *Fimbristylis*
rare
- 5 30 *Eriocaulon*
locally common
- 3 31 *Cyperus* ^{*polystachyus* Roth.}
common
- 6 32 *Fuirena* ^{*umbellata* Roth.}
common
- 6 33 *Cyperus* ^{*pilosus* Vahl OK J.H. Kern}
common in edge of
- 34 *Phylidrum lanuginosum*
occasional
- 5 35 *Thelypteris goggilodius*

±50 m.
↓
det. H. L.
even on

culms glossy, subterete,
slightly 3-angled.

~~extens~~ fronds extensively
twining and tangled,
mostly sterile.

OK
A. Chase

culms weakly erect;
leaves unpleasantly scabrous.
all 3 petals large, bright
blue.

OK
A. Chase

Cyrtosperma goggilodius (Schubert) Link

37836

Panicum ~~asperum~~

3

codominant

3

37

*Cyperus**oblongoides* Kunth

very local

2

38

Monochoria

very local

6

39

*Vigna**luteola* (Jacq.) Benth.

common

1

40

Glochidion

in dense Pandanus thicket

5

41

(Pennisetum) Saccolopis oxyetorum (Muhl.) Honda

edge of bog

same - lobe of higher grassland extending into bog.

5

42

Fimbristylis dichotoma (L.) Vahl

common

5

43

Fimbristylis

occasional

2

44

*Hedyotis**diffusa* Willd.

rare

3

45

Torenia

occasional.

2

46

*Hypericum**japonicum* Thunb.

rare

5

47

Ancilema

common

5

48

Curculigo orchioides Gaertn.

det.

common

bluish green. culms erect.

extensively twining; flowers yellow, bell bent upward but not twisted.

tree or large shrub, fruit ripe and shattering, flowers yellow, almost gone.

det. A. Chase

360 m.

det. T. H. Kern

flower purplish

flowers yellow

37849

Cyperus *haspan* L.

OK J H Kern

5

in wet spot

5 50

Euphorbia *paranannensis* Planch.
common

5 51

Dioscorea *bulbifera* L. (2 forms) - *paranannensis*
in edge of small thicket

1 52

Cyperus *globosus* All.
rare

same-grassy open terrace

3 53

Melastoma *osbeckianum* L.
occasional

9 54

Scleria *levis* Retz.

July 1 - 1 km. e. of Ishigaki City

5 55

Diospyros *persea* var. *crucifolia* (Roth)
growing around ancient tombserect with arching tips;
flowers white.
flowers at first white,
then purple.

60 m.

flowers rose pink

20 m.

*Bauhinia*erect compactly branched
tree 3-4 m. tall, fruit yellow.

July 3 - 1.6 km. w. of Azata

(191)
(Photo
950-6)

Large peat-bog, open, grassy, with no reeds, *Panicum* and *Isachne* more abundant in proportion to *Leersia* than in the other bog. Surface mat in ~~some~~ ^{most} places flexible. ~~Low~~ *Pandanus* thickets around edges. These have some *Gleichenia* and are tangled with *Lygodium scandens*. They vary much in density and from 1-4 m. in height.

This bog has a much less abundant and less varied sedge flora. *Fuirena* is the only common sedge.

The bog is fed by seeps from the "gravel" terraces around it. These are abundantly peat covered.

The bog is in some spots a true quaking bog.

Cattle grazing in it

(192)
(Photo
950-4)

(195)
(Photo
949-18)

Wendlandia
Ficus retusa
Miconia
Mallotus
Distylium
Ardisia
Callicarpa

Thickets on steep slopes and in ravine
Ficus erecta
Mallotus
Morus
Raphiolepis
Eurya
Symplocos
Elaeagnus
Smilax
Schefflera
Mussaenda
Rhus succedanea
Glochidion
Ficus wightiana
Gardenia
Premna
Trema
Bipinnatelegume
Celtis?
Melia
Melastoma
Pandanus
Cerbera
Erodia
Ficus virens
Ficus sp.
Cyathus
Phyllanthus
Ampelopsis
Bischofia
Angiosperma
Alcasia
Xanthoxylum (vine)
Arenca

(193)
(Photo
950-6)
(194)

Stream bank thickets
Bambusa
Barringtonia
Morus
Musa
Pterocarpus
Epipremnum
Ficus
Cerbera
Ficus retusa
Arundo donax
Bischofia
Ficus wightiana
Pipturus
Boehmeria
Ficus sp. ribbed fruit.
Macaranga

1956 Ryukyu Is.

n. of Mizu Dake, n. n. w. of Kawabaru

July 3. 3.5 km. w. n. w. of Miyama

37896

3

Cyathea pectinata (Thunb.) Copl.
common in thicket in
ravines

5

57 *Callicarpa japonica* var. *lucida* (Ridl.)
occasional in thicket
in ravines

July 3 - 1.6 km. n. of
Ozata, upper Miyama
Valley

in thickets along banks of stream

5

58 *Ficus ampelodes* (Sw.) Merr. f.
common

5

59 ~~*Diospyros*~~ *tea* *formosana* H. L. Li
occasional

July 3

same - steep slope
on dissected alluvial terrace

5

60 *Euscaphis japonica* (Thunb.) Kuntz
commonest shrub in thicket

5

61 *Arthraxon hispidus* var. *cryptatherum* (Hack.)
occasional in grass

5

62 ~~*Isachne*~~ *Sagittaria nitida* (Vahl)
common in grass beside
road

6

63 ~~*Isachne*~~ *Sphenomeria tenuifolia*
common on road cut wall

1

64 *Cassia mimosaoides*
rare in grass

40 m.

with trunk
tree, 3 m. tall, leaf scars
prominent, varied in size
and shape, 3 leaves from
same point; scales
on stem golden-tawny.

alt. 4 m.
Moldau

erect shrub 2.5 m. tall,
flowers lavender, fruit purple.

75 m.

small tree; fruit orange

small tree, flowers white.

40 m.

shrub 3 m. tall, ripe
fruit reddish, fleshy, dehiscent.

H. and A. close

Pers. 7 m. close

erect

flower yellow

- same - ^{grassy} peat bog
- 37865 *Phyllanthus*
edge of bog, rare
- 46 *Paspalum* ^{orbiculare & Fast.}
common on edge of bog
- 5 67 *Pandanus*
forming thickets in
bog

July 3 - Ishigaki Airport
e. of Hirak

- 5 68 *Ipomoea* ^{hardwickii (Spring.) Hemsl.}
common in cultivated
field

July 4 - west side of Kabira
peninsula, 1.7 km. w. n. w.
of Kabira

Below the present beach
is a long strip of very
much eroded beachrock
forming an erosion ramp.
This is a conglomerate
including many
non-limestone pebbles of
various sorts. It shows
evidence of moderate
abrasion and some solution
but no spall planes.

tree 4 m. tall, fruit
yellow, fleshy base
of leaf greatly swollen.

40 m. twining; flowers white

There is a low beach
ridge of sand, with
an irregular somewhat
discontinuous scrub of:

Pandanus
Dodonaea
Clerodendrum inerme
Scaevola
Wikstroemia

Below this on the beach is
a thin mat of *Lippia nodiflora*,
Pluvinetia, *Ipomoea pes-caprae*,
Ilexis, *Ipomoea littoralis*,
Spinifex, *Euphorbia chamerissii*,
etc.

Back of the beach ridge is a flat, partly open with thin grass and small shrubs. The grass is largely *Imperata*, but with several others intermixed. Prostrate *Vitex* is abundant locally. Shrubs are *Psidium*, *Pandanus*, *Clerodendrum*, *Glochidion*, etc.

Part of the flat has a patch of woods. This is of *Ficus*, *Bischofia*, *Hibiscus*, *Pandanus*, *Celtis*?, *Macaranga*, *Breynia*, *Melanolepis*, *Pisonia umbellifera*, *Diospyros maritima*, *Porteria*, *Ficus wrightiana*.

Undergrowth of *Allophylus*, *Alocasia*, + esp. *Glochidion*, *Munaya*, *Garcinia*.

On limestone outcrop *Ficus wrightiana*, *F. virgata*, *F. erecta* and *Arenya* are added and common.

Vines *Piper*, *Toddalia*

Shrine forest just back of beach. Mainly a grove of *Calophyllum* but with a few trees of *Hernandia*, *Hibiscus*, *Distylium*, *Raphiolepis*, *Callicarpa*. Shrine is merely a small enclosure of rocks with incense burners.

The reef flat in front of the low erosion ramp is flat and sandy. A large stiff *Codium*-like green alga is common. ~~Entoloma~~ *Halophila*, *Thalassia* and *Cymodocea* form thin mats of rhizomes under the sand, their leaves protruding.

July 4 - ~~177~~ West side
of Kabira Peninsula w. of Shishu
1.7 km. w. n. w. of Kabira Mori

37369 *Callicarpa japonica* var. *lanceolata* Heldr. 1 m.
edge of shrine forest back of beach

5 70 ~~*Samolus*~~ *pinifolia* (Miki) det. C. den Hartog 1969 1 m.
on ~~first~~ sandy reef flat

5 71 *Halophila ovalis* (R. Br.) Hook. f. det. C. den Hartog 1969 1 m.
on sandy reef flat

3 72 *Pisonia umbellifera* (Forst.) Seem. 2 m.
common in forest back of beach

5 73 *Dodonaea viscosa* 2 m.
~~common~~ abundant locally on
sandy beach ridge

July 4 - south of Kabira
2 74 (~~Melastoma~~) *Tristellateia australasica* A. Rich.
rare in edge of thicket

small tree 4 m. tall, slender,
flowers lavender.

forming a thin sod,
rhizomes buried; sterile.

forming thin sod,
rhizomes buried; sterile.

tree 8 m. tall; flowers white.

low bush 0.7 m. tall

10 m.

twining in trees,
petals bright yellow,
filaments bright red.

July 5 - 2.3-3 km. S.W. of
Hirakubo

(196)
(Photo
945-86)

Two conical hills
with Cycad scrub.

197 Sparse pine woods of
grassy foothills

198 Patch of wood has been
cleared except scattered
trees and an extensive
set of farm buildings
built in edge of it.

(199) This patch is now in
sweet potatoes

(200) Post miocene limestone
outcrops, the small ones
dominated by Cycas, the
larger by Ficus spp.

(201,
202)
(Photo
949-91)

These grassy slopes have
been freshly burned - still black.

(203) Mangrove swamp, the
lower part all Rhizophora
4-5 m. tall, the upper
part Excoecaria with
undergrowth of Kandelia,
some Bruguiera in uppermost
part.

(204) ~~204~~
~~204~~

Forest of post-miocene
limestone.

(205)

Valley bottom forest
has Barringtonia and
Ficus, etc. but not
swampy, growing on
broad rocky braided
stream bed.

Pongamia
lissocarpa
aculeata
and *P. umbellata*

Farther up ^{seen} much ~~dead~~ bamboo
Climbing the wall
on the left side up to
the main central ridge
between 2 peaks the
slope is steep. all
vision is cut off by
an undergrowth of
large clumps of Arenga.
It is possible to go
through this with a
little cutting.

So far as could be
seen the forest here
~~was~~ is principally
Ficus and some
Diospyros maritima.
Much tangled with
Flagellaria and *Smilax*

On the ridge top the Arenga
thins out.
Much Ficus, *Diospyros*, and

Rhus

Undergrowth of Croton,
Psychotria, Diospyros
saplings.

Up to 100 m. or more there
has been considerable
cutting.

On up to 200 m. is
steep slopes and
ridges with mixed
forest with considerable
Arenca and various
shrubs in under-
growth, much Smilax
flagellaris, and other
vines.

By about 200 m. there
is some Quercus, but
more Diospyros,
Lauraceae, Ardisia,
etc.

Ferns very common
here. Stature of
forest 8-10 m. trees
up to 20-25 cm. dbh.
crooked.

On top of first peak
is scrub forest
about 5-6 m. tall
fairly dense canopy
trees up to 10 (or 20) cm
dbh. Little undergrowth
incl. some Damacanthus,
Ilex, Eugenia, etc.

Trees are Portulaca,
Dendropanax, Cinnamomum?
Viburnum, ~~Rapanea~~
Ardisia, Rapirolepis etc.

Tangled with Eleagnus.

In saddles only a
little lower, the forest
is about twice as tall,
with big banyans
and considerable oak.
Some recent cutting
in this area.

Ridges and upper
slopes generally
with small woods,
logged out some time
ago. Old mine
 workings on ridges
with pyrite in
debris.

On a high east
~~west~~ slope below
a ridge crest a
dense low wood
about 4 m. high
trees to 5 (or 10) cm. dbh.

Here
Cinnamomum
Ardisia etc.
tangled with
similar Elaeagnus
etc.

Below this to s. ^{to} is
mixed forest with
little or no oak.
Much Ardisia,
Lauroseal, Diospyros
some Podocarpus (small)
Schepflera.

Ardisia, Diospyros
abundant downward
more and more
Ficus and Garcinia

In lowlands along ^{Yassa-} ~~Kawa~~
stream is thick
forest clear out to
beach on east coast
Here Hernandia goes
unusually far inland.

Along the coast
southwestward there
is wood on the low-
cut cliff. Back of this
is generally Imperata
grassland on the terrace
and in places well
up the steep mountain
slope.

July 5 - Yassa-Kawa
e. side of north peninsula.

37875 (comp.) *Carpesium cernuum* L.
5 lowland thickets along stream.

1 76 *Nyssa fruticans* Wurm.

3 77 *Antidesma*?
occasional on upper slopes of drainage
A. pentandrum (Blanco)

July 5 - ~~ridge~~ ridges
north of Hatakeyama
in thick moist forest

3 78 *Psychotria*
common in undergrowth

2 79 *Neolitsea*
Coccoloba laurifolia DC.
occasional

2 80 *Bescheria* *racemosa* S. & Z.
common locally

5 81 *Ilex* *canaburgii* Loos.
common on ridge top

1 82 *Malaxis*
rare *Tropidia* sp. possibly *T. comae* Hayata

4 83 *Polypodium* *Guineanum* M. Q.
climbing on tree trunks, rare

5 84 *Angiopteris erecta*
occasional *suboppositifolia* W. H. de Vries

10 m much branched tree,
dusk greenish yellow.

0 m fruit picked up on beach,
not known growing
on Ishigaki or nearer
than Iriomote, where
it is very rare.

Merr. (4) *var. barbatum* (Presl) Merr. (det aff.)

150 m.

300 m.

shrub 0.3 m. tall,
flowers greenish white,
fruit red.
shrub, fruits immature.

~~large~~ springy extensive
liana tangled in
low trees; sterile.
small slender tree,
fruit immature.

det. C. V. Morton

rhizome small, globose,
frond 1.2 m. long.

37885 (orchid) *Phaius*? *terrestris* Bl. det. L. A. Garay
7 on tree trunk

6 86 *Distylium racemosum* S. & Z.
Daphniphyllum
common

1 87 orchid
rare on tree trunk

3 88 *Damnacanthus indicus* Gaertn.
common locally

2 89 *Pyrosia*
lomaephyllum microphyllum Presl
common climbing
on tree trunks

Kara Gawa.

July 5 - stream 2 km.
s. of Hirakubo

2 90 *Polyscias*
Lycianthes biflora (Lour.) Bth
rare on low rather dry
wooded ridge

3 91 *Asclepias curassavica* L.
rare along trail

3 92 *Kandelia kandel* (L.) Merr.
common, forming under-
growth in edge of ~~upper~~
upstream part of mangrove
swamp

4 93 *Raphirolepis* *liukiuensis* (Koidz.) Nakai
common on low limestone bluffs

5 94 *Adiantum* *capillus-veneris* L.
in crevices in overhanging limestone

5 95 *Peperomia* *japonica* Makino
in crevices in overhanging limestone

370 m leaves terete, perianth
green, purplish tinged.
lip ~~is~~ dark maroon
purple inside, green tipped.
tree, cut for lumber.

350 m low bushes 0.6-0.8 m. tall,
flat topped.
closely appressed to
trunk, fertile fronds
rare, all fronds thinly
fleshy

60 m 90 branched herb 0.5 m. tall
fruit red, fleshy

5 m 91 erect herb 1 m. tall,
flowers with corolla red,
corona orange.

92 shrub ~~1-2~~ 1-2 m. tall,
flowers cream white

3 m 93 shrub 2 m. high,
spreading, diffuse, fruit
immature.

1-2 m 95 diffuse, fleshy.

July 7 - north of Shirahin
Thick scrub of

(206)
(Photo)

Premna, *Hibiscus*, *Ficus*
wrightiana, *Toddalia*,
Psidium, *Pittosporum*,
Carrnana, *Pandanus*,
Ficus erecta, *Zanthoxylum*
(small), *Alpinia speciosa*,
Cycas, *Merinda*, *Murraya*,
Mallotus, *Pipturus*, *Paphiopedilum*,
Allophylus, *Arenga*, *Miscanthus*
tangled with *Ampelopsis*.
This scrub is 2-4 m tall
and grows on low
ledges of rough limestone.

Similar
to
etc.

(207)

Most of it is a considerable
area of rock pasture
dominated by *Psidium*.
short *Imperata*, *Artemisia*
vulgaris, *Rosa*,
Lespedeza.

A little seaweed
around brush patches
even well inland
in the rock pasture.

(208)

Seaward of the
road is a more
typical littoral scrub
on a sand ridge dominated
by *Scaevola*, *Premna*,
and *Pandanus*, with
Merinda, *Allophylus*,
some *Casuarina*, *Ficus*
retusa, *Calophyllum*,

as scattered trees. *Vitex*,
Toddalia, *Zanthoxylum*,
Carrnana, *Phyllanthus*, *Rosa*,
Psidium, *Wikstroemia*,
as secondary shrubs.
Imperata, *Artemisia*
(green), *Zoysia* as most
important herbs.
Euphorbia charissensis.
This scrub varies from
dense and 2 m. tall to
very sparse and 1 m. or less.

Lophora

apocynaceae per-
capitulum

Lotus
carrythra

July 7 - s.w. of Azata

Rounded hills of schist, mostly grassy, with occasional clumps and patches of pine, especially of pine seedlings.

One of the hills mostly well wooded. Viewed from a short distance through binoculars ~~at~~ the forest presents the appearance of a very dense mixture of many species with no one of them dominant. Tree ferns common.

Around the base, on the north side, is a dissected alluvial terrace, the ravines with paddy fields in their bottoms, but with patches of wood in their narrow heads and side branches.

These ravines have a flora of small trees and large shrubs:

(1209)
(photo
945-14)

Rhus succedanea,
Morus, *Lymplocos* sp.,
Ficus 4 spp. *Schefflera*,
Distylium, *Premna*,
Macaranga, *Raphirolepis*,
Pandanus, *Trema*, *Laurac.*
a large-like, sterile tree very common
also the opposite leaved

compound leafed tree, ^{Arenca} *Mallotus*
paniculatus, *Phyllanthus*,
Mallotus sp. (glauca), *Elaeocarpus*
japonicus, several other
unidentified trees.

Flagellaria, similar
Vitis, etc. not too common.
Alpinia speciosa,
Cygodium flexuosum, etc.
around margins.

The alluvial terrace
is covered by dense
Imperata grassland,
with scattered pines.

The forest on the hill,
itself has

- o *Glochidion*
- o *Melanolepis*
- o *Ficus* (ribbed fr.)
- c *Rhus succedanea*
- o *Lymplocos* sp.?
- c *Bischofia*
- o *Ficus virgata*
- o *Arenca*
- o *Evodia*
- c *Lauraceae* (*Machilus*?)
- o *Aphronia*
- c *Mussaenda*
- lc *Pisonia aculeata*
- c *Lasiacanthus*
- c *Mallotus paniculatus*
- o *Boehmeria*

- 20 *Pterospermum* ^{carpum}
Ficus sp.
 c *Psychotria*
 c *Flagellaria indica*
 o *Garcinia*
 r *Clerodendrum trichotomum*
 20 *Ficus retusa*
 c *Andisia*
 o *Angiopteris evecta*
 c *Camellia japonica*
 o (tree with axillary
 fruits and thick pedicels)
 c *Diospyros maritima*
 c *Morus*
 c *Premna obtusifolia*
~~*Cinnamomum*~~
 o *Croton*
 c *Neolitsea*
 20 *Ficus*
 o *Antidesma*
 o *Mallotus philippinensis*
 r *Glaucocarpus japonicus*
 r *Pouteria*
 r *Quercus cuspidata* (rare, m. 24)
 r *Morinda umbellata*
 r *Randia* or *Diplospora*
 r *Maesa*
 r *Eurdenia*?
 r *Ficus* sp.
~~*Clerodendrum*~~
 o *Callicarpa* (small lf.)
 o *Macaranga*
 o *Schefflera*

Freylinetia
 (rare, climbing in giant
Ficus retusa & occasional
 on upper north slope.)

The general stature
 of this forest is about 6-8 m.
 with occasional trees
 much higher.

Undergrowth varied
 but generally rather
 loose except in open spots
 where it is thick.
 Ferns very common
 on ground, especially
 on north slope.
Polystichum, brown-hairy
Dryopteris (?), *Pectaria*
 common, *Asplenium nidus*
 occasional.

Oplismenus and the
 large *Oplismenus*-like
 grass common underfoot.
Alpinia sp. the white
 ground orchid, the spiral
 tall orchid, and *Sarcandra*
 occasional.

July 7 - Upper Mizara Bridge
in wooded flats along
river.

37896 (~~Trichosanthes~~) *Trichosanthes bracteata* Vahl
occasional in secondary
growth.

3 97 (~~Bambusa~~)
common

98 orchid *Neritophila* ~~sp.~~ *sp.* ^{det. L.A. Gentry}
common in silty soil
under trees

Kafuta,
~~Ahasbata~~
July 8, Hills southwest
of Ozato
in rather low scrubby
forest on schist soil.

99 (~~orchid~~) *Corymbopachia* ~~confusa~~ *confusa* ^{det. L.A. Gentry}
occasional

37900 *Pouteria*? *P. obovata* (R. Br.) Baehni
rare.

6 01 *Diplospora*? *Tarenna*
rare *Tarenna gyzokuchinkura* ^{det. L.A. Gentry}

5 02 *Maesa* *tenax* ^{det. L.A. Gentry}
occasional

5 03 *Morinda umbellata* L.
rare

5 04 *Diplospora*? *Tarenna gyzokuchinkura* ^{det. L.A. Gentry}
rare

20 m.

Vine, tangled in bushes,
ripe fruit bright orange,
pulpy seeds greenish black.

1-terminant,

tigorous to
it. To 15 m. tall,
lower branches
spring.
leaves globose,
broad
separate
s.

PLANTS OF THE RYUKYU ISLANDS

ISHIGAKI SHIMA

Just deep 7 this to Kew under
Bambusa

Locality Alsashita upper Mizara Bridge in
wooded flats along river.

Occurrence Common

Date 1956 Alt. 20 m. (from map)

Coll. F.R. Fosberg No. 37897

Remarks rhizome determinate, culms from
contiguous to 20 cm. apart, erect,
to 15 m. tall, dark green, lower branches
sparse not spring.

Pacific Vegetation Project

unbranched,
waxy white.

small tree 6 m. tall,
fruit immature
bush 2 m. tall, slender;
fruit green.

shrub 2.5 m. tall,
fruit immature.

OK 03 scandent shrub,
climbing in trees.

04 shrub 2.5 m. tall,
fruit with 3 peltate seeds
in a cell, not immersed
in placenta, immature.

PLANTS OF THE RYUKYU ISLANDS

ISHIGAKI SHIMA

I sent dup of this to Kew under
Bambusa

Locality Alsashita upper Mizara Bridge in
wooded flats along river. 10m

Occurrence Common

Date 1956 Alt. 20 m. (from map)

Coll. F.R. Fosberg No. 37897

rhizome determinate, culms from
Remarks contiguous to 20 cm. apart, erect,
to 15 m. tall, dark green, lower branches
sparse not spring.

Pacific Vegetation Project

July 7 - Upper Miyara Bridge
in wooded flats along
river.

37996 (~~canthit.~~) *Trichosanthes bracteata* Vahl.
occasional in secondary
growth.

3 97 (~~kanbo~~)
common

98 ~~adid~~ *Nerium indicum* L. ~~adid~~ *gaur* ~~adid~~ *gaur*
common in silty soil
under trees

Kafuta,
~~Akashita~~

July 8, Hills southwest
of Ozato
in rather low scrubby
forest on schist soil.

99 (~~adid~~) *Convolvulus confusus* Hance ~~adid~~ *gaur*
occasional

37900 *Pouteria*? *P. obtusa* (H. B.) Baehni
rare.

6 01 ~~Diplospora~~ *Tarenna*
rare *Tarenna gyoekushikawa* Chai

5 02 *Maesa* *tenax* Mky
occasional

5 03 *Morinda umbellata* L.
rare

5 04 ~~Diplospora~~ *Tarenna gyoekushikawa* Chai
rare

20 m.

Vine, tangled in bushes,
ripe fruit bright orange,
pulp around seeds greenish black.

rhizome determinate,
culms from contiguous to
20 cm. apart, erect to 15 m. tall,
dark green, lower branches
sparse, not spiny.
fruit green; tuber globose,
soft, fleshy; broad
leaves ~~near~~ on separate
young plants.

120-150 m.

stem erect, unbranched,
1 m. tall; flowers white.

small tree 6 m. tall,
fruit immature

bush 2 m. tall, slender;
fruit green.

shrub 2.5 m. tall,
fruit immature.

ok 03 scandent shrub,
climbing in trees.

04 shrub 2.5 m. tall,
fruit with 3 peltate seeds
in a cell, not immersed
in placenta, immature.

37905

Ficus erecta Thbg.?

3

rare

6 06

Trema orientalis Bl.

rare in wooded ravine

2 07

Vitis lanata Roxb.

common in wooded ravine

#

~~fast~~ July 7 - just north of Shiraho

5 08

Allophylus cummersii (DC.) Bl.

common in scrub on broad sand ridge

6 09

Morinda citrifolia var. *bracteata*

common in scrub on broad sand ridge

5 10

Premna obtusifolia R. Br. III

common in scrub on broad sand ridge

11

~~Stachys?~~

common on rough limestone outcrops in grassy pasture.

Tournefortia bicolor var. *miqueliana* (Maxon)

Hara

small tree, sterile.

small tree, ripe fruit ~~dark~~ purplish black.
vine climbing in trees.

10 m.

shrub 1 m. tall.
flowers white, fruit yellow.shrub 1.3 m. tall, flowers white; fruit ~~yellow~~ ^{orange} ~~ripe~~ ^{immature}.
all individuals seen were var. *bracteata*.shrub 1 m. tall;
flowers pale green;
fruit ripening unevenly,
ripe ones black.
flowers pinkish purple.

July 8 - 2 - 2.5 km. e. of
Yoshihara

Well developed ~~the~~ littoral
forest on beach ridge.

West of this, forest on
pitted limestone, *Pouteria*
very prominent.

A few hundred m. west
of this is a lobe of reef
with a reef flat about
150 m. wide. a more in
places. The reef flat is
about level but with
an irregular surface
with perhaps 1-2 dm
relief, covered by a fine
mixed algal fan.

The reef margin is
almost dead with only
a few scattered small
corals in crevices, small
surge channels and other
protected places. The
exposed portions of the
margin and surface
a few m. back of it appear
abraded and a dull
pinkish gray color. It
is not much abraded, though,
but covered by a weak
growth of a smooth somewhat

knobby *Porolithon*. It
is honeycombed by small
holes. The *Porolithon* is
actually in thin layers,
1-2 mm., over-lying each
other, in places making
up the rock, elsewhere
on rock of other origin.
The whole, when broken,
is seen to be riddled with
boring mollusks and
bipunculids. In a
cavity was found a
small gray, very active
spider. The cavity was
apparently silk-lined.
This is at least 1.5, probably
2 m. below high tide level.

There is very little
sand on this reef flat,
only such as is held
by the algal fan.

The honey-comb effect,
really not honey-combed
but deeply channelled
with holes 2-3 cm. in
diameter which are
sinuous and go parallel
with the plane of the
reef surface then curve
irregularly downward,
appears to be due to a small

lavender to purple excentric
echinoid, roughly oblong
in shape. These could
be seen in the bottoms
of many of the holes.

July 3 - 2 km. e. of Yoshihara
In dense broad strip of
littoral forest

37912 *Boehmeria formosana* Hayata

6 common along path

2 13 *Psychotria*

common in undergrowth

1 14 (ascl.) *Panzeria* ^{*heliconioides* H. & A.} *cunninghamii* A. DC.

common near seaward
edge along trail

2 15 *Maesa* ^{*lancea* T. & G.}
common in undergrowth

20 m.

17 shrub 1 m. tall.

— fruit immature.

18 extensive twining vine;
flowers yellow-green.

19 shrub 2 m. tall, very
slender; fruit immature.

July 10 - Kobama Jima
from sea on east or
~~southeast~~ side the
island looks grassy
with rather sparse
woods scattered here
and there. The woods
on the ~~east~~ peninsula
seem to be an open growth
of pine. On the ~~east~~^{north}
end are low bluffs
with wind-sheared
woods.

The two high hills
are grassy with
sparse bush. On their
flanks are areas of
bright green Imperata.
Much of this in the
low center part, also.

Patches of pine are
conspicuous at middle
altitudes on ~~eastern~~^{northern} part
of island, as well as on
the western peninsula.

Along coast a conspicuous
barrier of littoral scrub
or forest attenuating out
along the base of the
line of bluffs on the
~~east~~ end.

Paleozoic schist and
quartz schist exposed
near landing. Covered
with Pandanus thicket
with more and more
Ficus inland.

Up a bit there is post-
Miocene limestone
covered with Pandanus,
Cycas, Melanolepis, Ficus,
etc. Musa, Muraya,
arenga.

Between the limestone
outcrops is a fine gray-brown
soil. This is partly
cultivated - sugar cane,
sweet potatoes, - partly
very weedy.

A few small paddy
fields.

Slope of highest hill
grassy with abundant
Pandanus thicket.

At base abundant
fragments of schist.

There are 3 hills of a
shale or rotten schist,
all about the same
altitude. all grassy on
top but top surrounded

List of plants seen on island.

Casuarina
 Leucaena glauca
 Pandanus
 Acacia confusa
 Hibiscus tiliaceus
 Cycas
 Imperata
 Premna
 Calophyllum
 Miscanthus floridulus
 Psidium guajava
 Lygodium plexuosum
 Equisetum
 Vernonia cinerea
 Emilia sonchifolia
 Alocasia
 Muraya
 Ficus hetusa
 Ficus wightiana
 Alpinia speciosa
 Ampelopsis
 Melanolepis
 Melia
 Clematis
 Boehmeria nivea
 Eupatorium
 Arenga
 Cardiospermum
 Gynura
 Artemisia vulgaris
 Artemisia

Diospyros ferrea
 Pinus lucubra
 Annona
 Blumea (both spp.)
 Mussaenda
 Ficus erecta
~~Pittosporum~~
 Bidens pilosa
 Ruellia
 Ardisia
 Machilus
 Scaevola sericea
 Bipturus
 Dianella ensifolia
 Ficus religiosa

by thickets (on east hill only) of *Pandanus alpinus*, *Machilus*, *Muscamburus*, *Dudleya*, *Cycas*, *Alocasia*, *Eurya* etc.

On the side facing Irionote is a broad terrace, almost all under cultivation. The village is on the east side of this. Between the village and the sea is a lower terrace, also under cultivation.

Cultivation seems mostly cane and sweet potatoes.

Small clumps of forest scattered here and there, pine, broad-leaf, or mixed.

The terrace north of the 3 hills, also, is largely cultivated and has a scattering of wet paddies.

The foothills back of this terrace are grassy with *Pandanus* thickets.

Pandanus thickets are the most widespread feature of the vegetation

of this island. Even the pine groves have an understory of *Pandanus* scrub.

The little flat island north of Kobama has *Imperata* with scattered *Pandanus* thickets.

Near the landing the rock is splint but cut by dikes of volcanic material. West of the landing, along the shore, is an exposure of another kind of volcanic rock.

July 10 Taketomi

Rubus *boisii* (J) ?
Erythrina - *deikis*

The south end of the island is a scabby area mostly in *Imperata*, outcrops of limestone, the large ones with thickets of *Cycas*, *Acacia*, *Toddalia* and various shrubs - *Morus*, *Musa*, *Persea*, *Miscanthus* etc. occasional field cultivated - many beans, cane, etc. Most have been cultivated in the past but abandoned. Many stone walls in poor repair. Perhaps 10% of land cultivated now. Limestone outcrops everywhere. The seaward edge surrounded

by concentric belts of *Leucaena* and littoral forest or scrub.

A small shrine grove in south village has 1 tree each of *Ficus* ~~retusa~~ *retusa*? *Ficus* *vespertina*, *Pouteria*, *Machilus*, and *Garcinia*.

A pleasant cool spot.

Another near the north end has *Garcinia* and *Hibiscus* *tiliaceus*.

The large conspicuous grove at the south end has a number of enormous old *Calophyllum* trees, many of the largest *Garcinia* on the island, great *Hernandia*, *Diospyros*, *Ficus* *retusa* (one tree at gate).

It is cool, quiet and most impressive inside the grove, while sizzling hot outside.

Along reef from north end to pier are a series of outcrops. First is a series of schist dipping toward the big chert outcrop offshore. a big chert boulder lying on top of this.

Then more schist outcrops ~~beds~~ scattered along the reef, emerging through the present reef flat.

Then a short series of outcropping beds of a conglomerate including paleozoic fragments. quite variable in texture.

July 10 - Takelomi + Shima

~~village~~ ^{Hazama} ~~Habana~~ Village

37916 *Annona squamosa* L.
2 cultivated

- 5 17 north end, just east of Mi Taki
Thalassia hemprichii (Ehrenb.)
in sandy pools on reef flat
- 5 18 *Garcinia spicata* Hook. f.
in grove around shrine

0 m. *Aschers* in ^{Petermann det. C. den Hartog 1969} *sterile*

2 m.

tree; fruits green, some exuding yellow latex.

110

1956 Ryukyu Is.

~~village~~ Hatama Village

37919

Ficus retusa var.

5

in grove around shrine

5 20

Ficus virgata Reimw.

in grove around shrine

Nakasuji,

21

south central part of

Solanum verbasifolium L.edge of cultivated patch
in small thicket

2

22

Erythrina variegata var. *orientalis*

scattered in waste land

1

23

Achyranthes aspera L.

rare in waste land

3

24

*Conyza bonariensis*common in recently
abandoned or fallow fields

2

25

Rubus parvifolius var. *triphyllus* (Thunb.)common on limestone
outcrops

2

26

(Lab.) *Amiscomela indica* (L.) Kunthoccasional on pockets
of soil on limestone outcrops

3

27

Artemisia capillaris Thunb.

very common on waste land

28

Berchemia linearis DC.common on base limestone
outcrops

Tabetomi ?

111

20m.

large tree, all leaves small;

fruits deep maroon purple.

large tree, all leaves

branches drooping

at tips; fruit immature

island
10m.

shrub 2.5 m. high,

fruit immature.

(L.) Merr.

Tree 3 m. tall

much branched herb,

flowers greenish.

Nakai

stems prostrate to

ascending.

past flowering.

prostrate spreading

scandent shrub

ripe fruit blue-black

July 10 - Kobama jima,
Funa Saki

37929 *Pandanus*
5 forming thickets along beach

3 30 *Sphenomeris chinensis* (L.) Maxon
abundant on vertical
road cuts

3 31 *Melanolepis multiglandulosa*
Mallotus malaccensis (L.) M. & A.
common on limestone

3 32 *Mallotus japonicus* M. & A.
common on limestone

between O Take and
Funa Saki

3 33 *Pipturus arborescens* (Link.) C. B. Rob.
occasional in
thickets on limestone

5 34 *Ficus wightiana*
superba var. *japonica* Miq.
occasional in thickets
on limestone.

2 35 *Cycas revoluta* Thunb.
common on limestone

3 36 *Digitaria violascens* Link.
common in cultivated fields,
limestone soil

1 37 (grass) *Leptochloa panicea* (Retz.) Oliv.
common in cultivated
fields, limestone soil

1 38 (grass) *Eriochloa proserpa* (Retz.) C. E. Hall.
common in cultivated fields,
limestone soil

3-5 m.

shrubby tree 3 m. tall,
fruit orange-red.

fronds appressed to
banks [likely that this small less
finely divided, coriaceous fern deserves
some sort of name. It is probably the little one of 1 to 2 ft.
C. V. Whitman]

shrub 2.5 m. tall.

30-60 m.

shrub 2.5 m. tall

shrub 1.5 m. tall,
~~fertile~~ carpels forming
a globose mass,
hiding the seeds within.

H. det. Chase

on H. Chase

H. det. Chase

- 37979 *Phyllanthus simplex*
local in edges of
cultivated fields
- 3 40 *Euphorbia hirta* L. ^{st.}
common weed in
cultivated fields
- 3 41 *Ficus septica* Burm. f.
common in thickets
- 3 42 *Ardisia sieboldii* Mak.
common in thickets
- 3 43 *Vitex trifolia* var. *simplifolia* Cham.
common around
edges of thickets
- 1 44 (lab.) *Mosla gonocarpa* Maxim.
rare in cultivated field
- 2 45 *Fimbristylis*
grassy edges of rice fields
and trail sides
- 3 46 *Cyperus* ^{iria L.} ^{on I. H. Kam}
grassy ~~trail~~ sides
- 2 47 *Utraria* ^{crinita Desv.}
rare on grassy trail sides
- 4 48 ~~Andropogon~~ ^{Hemisthia javanica}
rare along grassy trails
- 2 49 (~~grass~~) ~~Andropogon~~ ^{intercedens R. Br.}
rare on edges of rice fields
Bothriochloa glabra (Rostk) A. Camus ^{det. R. Br.}
~~same as *Fimbristylis*~~ ^{det. R. Br.}
- 4 50 *Diospyros ferrea*
around tombs on
limestone outcrop
- 5 51 (~~sterile~~) *Melochia coccinifolia* L.
weed in cultivated fields

small tree; fruit
immature, depressed
globose, ribbed.
- shrub 2 m. tall;
flowers white
- shrub 1 m. tall;
flowers blue-lavender

flowers rose-purple
caespitose

tree 5 m. tall, compact,
fruit yellowish.
flowers purplish pink

116

1956 Ryukyu Is

37952 *Ernia sonchifolia* (L.) DC.
weeds in cultivated fields.

2

same - *Funa falsi*
on metamorphic rocks
in full sun.4 53 *Portulaca oleracea* L. *?
common4 54 *Phyllanthus urinaria* L.
common

same - O Take

4 55 *Lygodium flexuosum*
common in thickets
hill of soft schist2 56 *Ficus erecta* var. *becheyana* (H. & A.) King
occasional in thickets
on slopes3 57 *Dianella ensifolia*
common on slopes3 58 *Eurya*
common on slopes3 59 *Carmona retusa*
Ehretia microphylla Lam.
common in thickets on slopes3 60 *Ficus erecta* Thunb.
common in low thickets
around summit1 61 *Ardisia sieboldii* Miq.
~~in low~~ around summit
in low thicket4 62 *Machilus* ? *thunbergii* S. & Z.
on summit, common5 63 *Mussaenda parviflora* Miq.
in thickets around summit

Kobama ?

117

3 m.

plant fleshy, bronzed;
petals deeply bifid,
5 mm. long, yellow.

75 m.

L. macrophyllum var. *glabrescens* Miq.
det. E. A. Valentine
fronds extensively
warming

flowers light blue

shrub 1 m. tall;
ripe fruit black;
arching bush; ripe
fruit orange-red.

98 m.

shrub 1 m. tall, ripe
fruit dark purple.shrub 2 m. tall,
flowers white.shrub 2 m. tall;
sterileshrub 1.5 m. tall,
flowers with yellow
corolla, white enlarged sepal.

118

1956 Ryukyu Is.

37964

*Eupatorium**quasitripartitum* (Hayata) N. S. W.*formosense* var.

2

common on grassy summit

2 65

~~*Vicia*~~ *toxiaria**Cynantherum* *distichum* Wats.

tangled in thickets

on slopes

2 66

Psychotria serpens L.

on slopes

2 67

Fimbristylis *multistachya* (L.)

common along trail

in grass

Kobama I.

119

erect herb 0.8 m. tall,
 flowers whitish
 with honey-like odor.
 flowers brownish.

scandent shrub.

caespitose

July 12 - 2 km. north of Ishigaki City

grassy abandoned paddy field

37948 *Fimbristylis dichotoma* (L.) Vahl
common1 49 (~~grass~~) *Eriochloa proserna* (Retz.) C. E. Hubb.
occasional1 70 *Ischaemum crassipes* (Steud.) Thell.
rare around edges5 71 *Aeschynomene indica* L.
dominant locally in

60 m

OK J. H. Kuhn

A. close

det. A. Kuhn

erect much-branched
herb to 1 m. tall; flowers
greenish yellow, marked
outside with brown.

July 14
north of Banna Lake

(210)
(photo
940-42)

Scrub forest about 4-5 m.
high. Composition:

Premna obtusifolia
Mallotus japonicus
Glochidion hongkongense
Wendlandia

Eurodia

Mussa

Elaeagnus

Glochidion lanceolatum

Eugenia baxifolia

Eugenia jambos

Ardisia

Psychotria linkiuensis

Diospyros maritima

Schefflera

Lasianthus 2 spp.

Arenca

Barringtonia racemosa

Ficus benquetensis

Rhus succedanea

Carandha

Angiostem

Bridelia

Miscanthus

Flagellaria

Lonicera

Coffee farm, several
ferns common on ground
Barringtonia and *Eugenia*
jambos particularly

Saurauja
Cyathes
Quercus

along streams.
Land rather flat
with ravines cut
in it to about 2 m.
depth. Great angular
boulders in ravines
mostly diorite.
Underlain by soft
conglomerate and
soft sandstone.

July 14 - just above Kaiman V.

(211)
(Photo
940-43)

Ravine forest -

very irregular -
composition:

Mallotus japonicus

Ficus sp. (ribbed fruit)

Bischofia javanica

Boehmeria ?

Ardisia 2 spp.

Flagellaria

Amilax

Piper

Ficus sp.

Angiostem

Arenca

Psychotria

Caesalpinia

Pterocarpus

Ficus (small lfd. virgate)

Ficus sp.

Cyathes

Mallotus paniculatus

Maes
 Mussaenda
 Rhus succadanea
 Schefflera
 Ficus retusa
 Morus
 Glochidion longkongense
 Evodia
 Celtis?
 Ginnamomum camphora
 Pousteria
 Crataeva
 Clematis
 Mallotus philippinensis
 Clerodendrum trichotomum
 Machilus
 Garcinia spicata
 Freziera
 Ficus virgata
 Melanolepis

July 14 - just north of Kainan
 Village upper Meyara Valley
 thickly wooded ravine

37972 *Pisonia umbellifera* (Forst.) Seem.

5 73 *Ficus benckii* Hayata
common

5 74 *Oreocnide pedunculata* (Shirai) Masam.
~~*Aschmannia*~~
 common around edges

70 m.

small tree, fruit immature

large tree without
 aerial roots, fruit
 clusters on ~~the~~ large
 branches, fruit almost
 spherical, green.

shrub ~~2.5~~ 3 m. tall, very
bushy

- 77975 *Cinnamomum camthora* (L.) Presl occasional
3
- 4 76 *Canavalia turgida* Jth Graham occasional
- 2 77 *Solanum aculeatissimum* Jacq. rare along trail
- 9 78 *Ficus Benguetensis* Merr. (= *F. myagalis* Koidz.) common

July 14 - 3 km. east of Nagura

- 3 79 *Miscanthus floridulus* (Labill.) Winkl. common, this from edge of thicket.
- 7 80 *Randia*? *Tarenna gymnantha* (Thunb.) Chrys. rare in shrub layer
- 3 81 ~~*Asplenium*~~ *Allyrium lanceum* (Thunb.) Middle terrestrial, on roadside bank
- 2 82 *Elaeocarpus japonicus* S. & Z. rare along stream
- 7 83 *Ardisia quinquegona* Bl. occasional
- 5 84 *Saurauia tristyla* var. *oldhamii* (Hemsl.) Finet & Gagnep. common along stream
- 5 85 *Bridelia* ~~common~~ occasional.

37985a

→ *Ottelia alismoides* (L.) Pers. det. C. den Hartog 1969

- shrub 2.5 m. tall, aromatic when broken; sterile; leaves glaucous beneath, extensive twining vine; flowers ~~for~~ rose pink; pods inflated.
- flower white; fruit globose, scarlet.
- small tree, 4 m. tall, figs globose, dark green, not ribbed.

75 m.

canes 2 m. tall, curved; flowering out of season

shrub 1 m. tall, flowers white, corolla lobes somewhat twisted.

small tree, sterile.

- slender shrub 1.5 m. tall, fruit more or less pentagonal, depressed globose.
- spreading tree; fruits borne on stems, white and fleshy when ripe.
- small tree, fruit greenish.

July 15 YCAT compound
 1 km. west of ~~Nagasaki~~ ^{Nagasaki}
 planted ~~in~~ around buildings
 and in gardens.

37986

Casuarina equisetifolia L.

5

widely planted on island

3

87

Gaillardia picta

in garden *G. pulchella* Foug.

3

88

Acalyphaamentacea

var. *willdeniana* (M.-A.)

2

3

89

Codiaeum variegatum Bl.

July 15 -

Nagasaki

(H2)

(Photo)

940-39)

patch of *Miscanthus condensatus*
Hanguana (?)
 in small muddy
 field ~~at mouth~~ in
 small stream.

The plant forms a
 solid stand about 2 m.
 tall in soupy mud.

It is light green.
 all sterile at this time.
 spreads by hollow
 septate rhizomes.

(217)

Northwest
 of this is a
 stretch of marsh
 dominated by *Panicum*
repens, gradually
 changing northward

2 m.

↓

trees 5 m. tall, (two trees
 represented in specimen)

much branched herb,
 flowers red and yellow

shrub 2 m. tall, leaves
 variegated, red, yellow
 and green.

shrub 1.2 m. tall, leaves
 dark maroon-purple
 and green, sterile.

& *Typha* and *Isachne*
 with some *Panicum*
 and a scattering
 of 3 sp. *Cyperus*, *Stenopus*,
Cladium, *Fuirena*,
Fimbristylis, etc.

The soil seems to
 be a sticky mud.
 very little structure
 preserved.

Locally are patches of
 reeds, 1 m. higher ground
 where it is almost dry
Imperata and *Miscanthus*
 with *Artemisia* take over.

July 15 1 km.
north-west of Nagura

(215)
(photo
940-39)

Large area of
Manscus marsh
with some patches
of reeds.

July 15 - 1 km. northwest of
Nagura
in paddy field, already
harvested

37985a *Ottelia*? *O. alba* - side Pers.
abundant, submerged
except flowers

2 86a *Spirochela polyrrhiza* (L.) Fehleid.
common, floating

2 87a *Azolla imbricata* (Buxb.) Nakai
~~ocean~~ common, floating

July 15 - 1.5 km. s.w. of
Nagura
in marsh, growing
in deep stiff mud.

7 88a ~~*Sagittaria*~~ *Adiantum* *farinosum* (L.) Kuntze
common locally

2 89a *Zizania angustifolia* L.
abundant T. "angustata" Bong &

4 90 *Fimbristylis*
common

5 91 *Isachne globosa* (Thunb.) Kunze
abundant

5 92 *Lirpus validus* Vahl
local

5 m.

flower pinkish white,
emerged.

mixed with *Azolla imbricata*

det.
Dr. Vol.

1 m.

flowers white.

rhizome deeply buried

Champs

Porter

ok
A. Chase

small ~~tufts~~ ^{number} of
erect stems, leaves at
right angles to stem.
stems erect, subterete, soft
rhizome orange red, deeply buried.

- 37993 *Cyperus glaberrimus* All. OK J.W. Kern
 5 common locally
 5 94 ~~*Rhynchospora*~~ *Schoenus falcatus* R. Br.
 common on sandy
 edges of marsh

July 15 - 2 km. s.w. of
 Nagura

- 1 95 ~~*Homalium*~~ *Miscanthus ciliaris* H. B. K.
 large dense colony in the
 paddy field in deep mud.

July 16 - 2 km. s.w. of Nagura

Lower slopes are
 mostly cleared and
 in *Imperata*, *Scleria*,
 etc.

(214)

Photo
 843-132

Blus

Lower forest is
Diospyros, *Ardisia*,
Morus, *Ficus*, *Daphniphyllum*,
Machilus? *Diospyros* *persea*,
Styrax, etc.
 Small trees 4-5 m. tall
 up to 15 cm. dbh
 thin undergrowth
 mostly *Psychotria*,
Eugenia, *Ficus*? *Eurya*,
Schinus.

(215)

Up the slope the
 stature becomes greater
 perhaps 5-8 m. Composition
 does not change much
 a few enormous also

densely caespitose.

1 m.

det. A. Chase

2 m. tall, sterile.

round topped spreading
 pines on ~~slopes~~ ridges.
 Ferns and *Ligularia*
 fairly common.
 Ferns mostly *Pteris*
 and the brown hairy
Dryopteris.
 Undergrowth thicker
 and more dense here.

some vines, *Ficus*, etc.
 throughout, but not
 many.

(216)

Some *Garcinia*, *Mallotus*,
Philippinensis, *Elaeagnus*,
Dendropanax, *Ficus* *retusa*,
 a few enormous *Machilus*
 (6-7 dm. dbh.), on higher
 ridges, first *Garcinia* not

~~far from top.~~

Large *bananas*
F. variegata & *F. retusa*.
~~F. variegata~~ *Craton*

(217)

becomes abundant in
undergrowth, and
near top. *Tectaria*
in fern layers.

No epiphytes
except a very few
Asplenium nidus.

A little *Clatocarpus*
on top but no *Quercus*.
Some *Mallotus philippinensis*

(218)

Along the crest and
where not cleared, down
some way on the east
slope is a dense scrub
3-4 m. tall of *Distylium*,
Glochidion, some *Rhus*,
Mallotus, *Ficus*, *Artisia*,
Bromna, *Elaeagnus*, *Cinnamomum*,
Eugenia, *Viburnum*, etc.

(219)

The cleared east slope
is largely *Miscanthus*.
some of it 2-3 m. tall
in sheltered spots.

In the scrub is little
and no ground cover
and little undergrowth
but trees are spaced
0.5 - 1 m. apart and

penetration is slow.

(220)

going down ravine
on ~~east~~ west side
The first grade
is very gentle
and the bottom broad.
then a curve-like
springy place,
then rather steep,
grade and narrow
rocky bottom.

Trees here are
large, up to 15 m.

Some enormous
buttressed *Ficus*,
of a cauliflorous
species (like 37977).

Ferns profuse
and luxuriant,
many species, all
terrestrial. Some
arenga.

Garcinia common
a few large *Melaleuca*.
Other species more or less
as on slopes and ridges.

(221)

Ficus (ribbed) common in
lower half. *Bromna*.

Livistona, only very
young trees, scattered
sparingly generally
on this mountain.

Water only in upper part of ravine

1956 Ryukyu Is.

July 16 - 3 km. 15° E. of N. of Iriomote

On a knoll toward sea from mountains is a grove of large *Livistona* with an undergrowth of *Cyrtos* and *Pandanus*.

The palms are away the landward slopes of the knoll. up the slopes they are replaced by a forest of *Ficus*, *Macaranga*, *Ardisia*, *Liquidambar*, *Machilus*, *Diospyros*, etc.

with a thick shrub layer largely of young *Livistona*. Top of knoll has brush, *Miscanthus* and some *Livistona* & few *Ficus*.

Psychotria general.

Many palms have been cut, presumably for the ^{upper} leaves, as bases of petioles are abundant.

July 16 - 2.5 km. S. of

Hirakubo ravine on steep slope - has forest up to 15 m. tall, a few big trees, mostly *Ficus*, with *Diospyros*, *Macaranga*, *Ardisia*.

thick undergrowth of *Psychotria*, *Arenca*.

Ferns abundant

Ridge S. of this. has a scrubby dryer forest to 3 m. tall with *Diospyros*, *Ferns*, *Ardisia*, *Ficus*, *D. maritima*, *Arenca*, *Lauracea*, *Garcinia*, *Arenca* etc.

Rhus,
Cassia

few ferns some undergrowth of *Croton*, *Psychotria*, *Arenca* etc.

But no *Quercus* to possibly 150-175 m.

1956 Ryukyu Is.

back of Kida Lake,

July 16 - 3 km. 15° e. of n. of

~~Hirakawa~~ Ibaruma

37996

Livistona chinensis ^{fruit used} ~~subsp. *delavayi*~~

2

abundant on low knoll
on coastal terrace

July 17 - 2.5 km. e. of
~~Hirakawa~~ back of Yabaga Lake
 July 16 - 2 km. 15° e. of north
 of Ibaruma
 in thicket in ravine.

6

97

Flagellaria indica
common

3

98

Ardisia sieboldii Miq.
common

5

99

Clerodendrum trichotomum Thunb.
common

41 m.

(Hawaii) B. 11. 15.

tree with straight
 trunk 4 m. high, lower
 part smooth, upper
 1 m. showing rather
 close set leaf scars,
 trunk with a distinct
 "bark" about 1 cm. thick,
 leaves with narrow
 free tips of segments
 drooping; fruit
 immature but
 possibly about full
 size, ellipsoidal.
 (most trees in grove
 not fruiting) (leaf-
 bases with stipules
 not from same tree - they
 are from young leaves
 harvested for making
 rain-coats).

40 m.

wine tangled in trees,
 fruit immature.
 - small tree, flowers
 white, fruit green, round.
 - small tree, corolla lobes white, tube
 crimson.

1956 Ryukyu Is.
w. slopes of Yabaga Dale
July 16 - 20-30° ~~W.~~ of N. of
Ibaruma

in bottom of ravine on
steep slope

38000 *Trema orientalis* Bl.
rare

1 01 ~~Asplenium~~ *Athyrium lanceum* (Thunb.)
common on rocks

2 02 *Asplenium unilaterale* Lam.
common on rocks

2 03 *Hoya carnosq*
common on rocks and
fallen tree trunks

same - summit ridge

1 04 *Polygala japonica* Hook.
rare on rocks in full sun

1 05 *Ligularia tessilaginea* (Pursh f.) Makino
common at edge of *Fagopyrum*
scrub forest

4 06 *Viburnum awabaki* K. Koch
common in scrub forest

same on high, densely
wooded ridge

10 07 *Claoxycarpus*
occasional

3 08 *Callicarpa inornata* Masam.
occasional in undergrowth

same - on steep densely
wooded slope

2 09 *Daphniphyllum*?
common *Dicorythium* (Lam.) S. & Z.

120 m.

large open-branched
tree 15 m. high; ripe
fruit purplish black.

180 m.

180 m.

vine, leaves very thick,
flowers ~~white~~ waxy,
white with red center
to corona.

210 m.

flowers yellow, mostly
not flowering.

Sapranthus
(L.f.) Kitam.

200 m.

tree 10 m. tall, flowers
white.

200 m.

tree 10 m. high

38010

109

~~leaves?~~ *Daphniphyllum* *teijmannii* var.
rare *isomutense* Hara

3 11

lex
rare in undergrowth

5 12

Diospyros ~~*tittorata*~~ *maritima* Bl.
very common

July 20 - s. side Yabubuku.

223
(photo
950-124)

Pandanus, scrub in ravine.

(224)

Terrace with dense
Imperata, some admixture
of *Pennisetum*, *Heliconia*,
Osbeckia, *Cantharoppermum*,
Rhynchospora, *ultra*, *Rosa*,
Paspalum *orbiculare*, *Setaria*, etc.
The grass is dense and
up to waist deep.
A few scattered large
spreading pines.

(225)

Strip of ravine forest
with ~~*Cerbera*~~ *Cerbera*,
Pandanus, *Macaranga*,
Ficus 2 spp., *Bischofia* *parviflora*,
The grassy hills
here are covered by
Miscanthus with
scattered pines. The
terraces at base with

F. wrightii
Eusodia
Carya-like
Schefflera
Melia

small tree, fruit
green

shrub 2 m. tall.

fruit immature
tree 10 m. tall, leaves
dark green; fruit
immature

Imperata some cultivation
smaller ravine.
filled with *Pandanus*.
more important ones
with ravine forest
very mixed.
The wooded hill,
so far as can be
seen, seem to have
a degraded *Ficus*
forest, much tangled
with vines, and with,
locally scattered pines.

(226)

Ravine forest with
Pandanus
Rhus
Bischofia
Macaranga
Melia

Maesa
 Pontederia
 Mallotus japonicus
 Ficus virens
 Symplocos?
 Thespesia
 Pithoeclolobium?
 Annona? ~~prickly~~ spiny trunk
 Ardisia
 Diospyros maritima
 Cordia
 opt. loed. semat. trifoliate
 shrub.
 Mallotus paniculatus
 Garcinia
 Clerberg
 Chretia
 "Brennia"
 Machilus
 Ficus retusa
 Raphiolepis
 Distylium
 Ficus cauliflora
 Scheffler

July 20 - Sakieda, 1 km. s.e. of
 Yababu Lake, s. side
 of Yababu Peninsula
 in wooded ravine

- 38013
 5 Ardisia sieboldii Nag.
 common
 3 14 Vitis lamata Roxb.
 occasional
 7 15 Turpinia cernata Nakai
 common

40 m.

shrub 3 m. tall,
 flowers ^{pinkish} white
 - vine, climbing in
 thicket
 - small tree 6 m. tall,
 fruit immature.

146

1956 Ryukyu Is.

38016

~~*Pithecolobium*~~ *Albizia lebbek* (Willd.) Benth.
common

2

same - on open grassy
terrace

5 17

Hypericum japonicum Thunb.
common locally

3 18

Setaria pentstemon (Weig.) Hubb.
common generally

2 19

~~*Sorghastrum*~~ *Sorghum nitidum* (Vahl)
common

2 20

Mitrasacme pygmaea R. Br.
very local on bare soil

1 21

Alysicarpus vaginalis (L.) DC.
occasional

1 22

Rhynchospora nilg (Lour.) Makino
on bare roadside

3 23

Fimbristylis
on bare roadside

4 24

(grass) *Bothriochloa glabra* (Rostk.) A. Camus
occasional in disturbed places

25 ~~*Cyperus*~~

same - in moist ground
below spring

5 25

Cyperus
rare *Lipocarpus senegalensis* (Lam.) Dandy

7 26

Fimbristylis miliacea (L.) Vahl
common

2 27

(leaf.)
rare *Polygala glaucoides* L. var. ?

2 28

Cyperus globosus All.
occasional

2 29

Fimbristylis
rare

ISHIOAKI ISLAND.

147

tree, buds very young.

40m.

det. A. Chase

Pers. A. Chase

flowers white.

stems trailing

det. A. Chase

caespitose

caespitose, blade set
perpendicular to sheath.
flowers purple.

38030

Torenia

occasional

1

31

(Saccilepis) Saccilepis oxyptera (Mabino) Honda

rare

just south of

July 20 - Ogan Zaki, n.w.
point of Yarabu Peninsula
on rough limestone rocks

3

32

*Phyllanthus*edge of low cliff just above
high tide level

2

33

Thlaspi?*(Thlaspi) Thlaspi*common at and below high
tide level

3

34

Limonium arbusculum (Maxim.)

common at and below high tide level

35

Fimbristylis cymosa

5

35

Fimbristylis cymosa

(also on volcanic rocks)

36

Ledum uniflorum H. & A. det. R. M. M.very local, just above
high tide level on detached
boulder

Sunai, near Ogan Zaki

on sand ridge

37

Canavalia turgida Graham?

common

July 20 - Ogan Zaki,
n.w. point of Yarabu Peninsula
on steep sloping volcanic
tuff in open very low
vegetation, above sea.

(over)

det.
A. Chase

1-2 m.

shrub, 1 m. tall, leaves
not distichous.

Hort. of

forming a dense mat
clinging close to rock.

Mabino

depressed dwarf shrub,
leaves sub-fleshy, flowers
lavender.

OK J. H. K.

caespitose

plant pale glaucous
green, fleshy.

2 m.

prostrate, creeping;
flowers pink.

- 38038 (grass) *Butiola* *leucostachya* (Hayata) Ohwi
 5 very abundant on steep slope
 5 39 (legume) *Galactia* *hachikawa* (Hayata) Ohwi
 very common
 1 40 *Pteris* *fauvelii* Simon.
 in crevice in high cliff
 4 41 *Cocculus* *trilobus* (Thunb.) DC.
 local on high crest
 3 42 *Hedyotis* *albido-punctata*
 common generally
Oldenlandia

July 21 - summit of
 Yarabu Dake

in ^{sclerophyll} scrub forest on
 volcanic rock

- 5 43 *Mallotus* *japonicus* M.-A.
 edge of ~~open~~ small clearing
 6 44 *Daphniphyllum*
 common *Distylium* *racemosum* E. & Z.
 2 45 *Diospyros* *ferrea* var.
 very common *busifolia* (Pittb.)
 3 46 *Raphiolepis* *liukiuensis* (Koidz.) Nakai
 common
 6 47 *Daphniphyllum* *tristemonii* (var. *oldhamii*)
 occasional *Hurmannia*
 5 48 (anem.) *Michelia* *compressa* (Maxim.) Sargent
 common

July 21 - ridge ~~at~~ m.e. of
 Yarabu Dake
 on densely wooded broad
 ridge

forming a loose mat.

prostrate, forming
 loose mats.

twining in low scrub,
 flowers white.
 prostrate, long plants
 in shade of rocks,
 short ones in full sun;
 flowers white.

shrub 2 m. tall.

shrub 2 m. tall.

small tree 3 m. tall;
~~fruit~~ fruit immature
 (yellow when ripe).

shrub 2 m. tall; veins pellucid;
 fruit immature.

shrub 2 m. tall; fruit
 immature

shrub 2 m. tall,
 fruit green.

38049
2*Diplospora*
occasional

9 52

Neolitsea dubia Hedy. det. C.K. Allen
occasional

4 51

Podocarpus macrophyllus
occasional (Thunb.) D. Don

1 52

Ilex maximowicziana Less.?
occasional

5 53

Ardisia pentagyna L.
occasional *quinquegona* Bl.

3 54

Callicarpa inornata Maxim.
occasional

4 55

Cinnamomum *japonicum* Sieb.
occasional

4 56

Ficus ampelosa Burmf.
common at lower levels

1 57

Pleuroblastus ganineus (Horn) Nakai
abundant at lower
levels, forming understory
in rather dry forest.July 24 - north side
of Yanabu Peninsula
in lowland thickets

3 58

Ficus septica
common

3 59

Lambertia
common

160 m.

tree; fruit immature.

↓

tree 3 m. tall, 10 cm. dbh;
fruit immature.
small tree 15 m. tall,
sterile.~~shrub~~ shrub, fruit immature,
insect galls conspicuous.shrub 1.5 m. tall; fruit
immature, depressed
globose, slightly pentagonal.shrub 2 m. tall,
fruit immature.small tree, sterile;
leaves both opposite and
alternate.shrub or small tree,
fruit yellowish.

100 m.

det.
F. A. McClureerect, stems green, in
small clumps from
rhizome.

20 m.

small tree, fruit depressed
globose, ribbed, immature.
shrub 2 m. tall;
flowers white, fruit
bright red.

July 21 - north side of
Yarabu Peninsula

(227)
(Photo
950-68)

(228)

Lower slopes have masses of rough post-Miocene limestone with openings and thickets. Above the last limestone the slopes are wooded and the forest is more or less typical *Diospyros-Ardisia* forest. In addition to the *Diospyros* mantling and *Ardisia* there are *Diospyros ferrea*, *Ficus*, *Dendropanax*, *Elaeocarpus japonicus*, *Schefflera octophylla*, and other species.

(229)

At the top of the slope is a more or less level broad-topped ridge, well wooded with a forest about 15 m. tall of *Ficus retusa*, the cauliflorous *Ficus*, *Cinnamomum*, and *Dendropanax* as the commonest trees.

(230)
(Photo
950-176)

Where this ridge begins a narrow and *vis* *Quercus cuspidata* comes in and becomes fairly abundant. *Podocarpus* is a common understory tree, here reaching 5 m. tall.

From here on ~~westward~~ southward the forest becomes lower in places, perhaps 10 m., with *Quercus*, *Elaeocarpus*, *Dendropanax*, *Diospyros ferrea*, *Ilex*?, *Piplospora*?, *Ardisia*, etc. For some distance there are very few ferns. The undergrowth is of *Psychotria*, *Eugenia*, and, well up, *Croton*. There is a very little *Freyssinetia*, no epiphytes.

Along the ridge toward Yarabu Dake are signs of disturbance in the form of such plants as *Trema*, *Mallotus paniculatus*, etc.

In places on the slopes of ~~the~~ Yarabu Dake itself the forest is higher, more luxuriant, with considerable ferns on the ground.

The actual peak is a knob of volcanic breccia, somewhat disturbed by an installation of some sort put up by the Japanese during the war. Here are a few pioneers such as *Mallotus japonicus*. This knob is surrounded by

a scrub forest of *Diospyros* *ferrea*, *Ilex*, *Myrsine*?, *Premna*, *Ficus* *virgata*, "Breyeria", *Eusonymus*?, *Firmiana*?, *Rhus* *succedanea*, *Raphiolepis*, *Porteria*, *Carnellia*, *Arenca*, *Daphniphyllum*, *Garcinia*, *Ficus* *retusa*, *Dendropanax*, *Podocarpus* etc. This is dense and only 3-5 m. high. The rock surface under it has *Pyrosia*, *Peperomia*, etc. The *Peperomia* is flaccid and not very fleshy, has no spines. Probably result of drought.

From here the high country, of broad ridges at about the same height, seems largely covered with oak forest, if the large spreading gray-green trees which cover up to 60% of the area are oak, as is probable.

Eastward the oak seems less prominent and the large rounded eastern peak seems not to have any.

Garcinia seems scattered through most of the forest seen on this mountain mass.

On the ridge summit is a low scrub of *Porteria* and *Scaevola* with *Coccoloba*. In sheltered places are dense patches of *Siphocampylus*. The north cliffs and offshoot rocks are entirely bare of vegetation.

(232)
(photo)
750-70)

going down the main westward gulch from Yababu Dake the oak very soon disappears, leaving a *Diospyros*-*Ardisia* forest with more and more *Ficus* lower down. The gulch is wet and ferns are luxuriant.

The west coast is lined with bluffs of post-Miocene limestone with the usual forest. *Limonium*, *Hedyotis*, ~~*Pentstemon*~~ *sedum*, *Fimbristylis*, *Illecebrum* (?) common at about high tide level. On some of the low cliffs are fair sized *Pemphis* trees (3-4 m.)

Ogan Zaki is the n.w. point, is of bedded, seaward dipping brown and green tuffs. The seaward parts are bare of vegetation. Between tides they are conspicuously pitted by sea urchins.

The flora is much poorer than that of corresponding limestone strand. The only plants seen common to both are *Scaevola*, *Porteria*, *Vitex*, *Hedyotis*, *Zoysia* *teninifolia* and *Fimbristylis*.

The vegetation on seaward steep slopes & bluffs is of patches of low *Scaevola*, low *Landanum* scrub, *Miscanthus*, and a low mixture of *Fimbristylis*, *Zoysia* 2 spp., *Indigofera*, *Elubrinensis*, a prostrate pea, (*Hedyotis* *albidopunctata*) and a soft grass.

July 21 - Inota

2 grassy patches
south of s. part of Inota
are *Miscanthus*.

2 patches north of
n. part are *Imperata*.
with some *Miscanthus*
on w. slope over road.

Wide belt of littoral
forest in front of Inota
and also in front of
village just north of
Inota.

Many patches of
forest on lower slopes
of mts. being cleared
for pineapples, all along here.

North of village
north of Inota the steeper
grassy slopes are *Miscanthus*
the lower gentler ones are
Imperata.

Wooded slopes across
bay from Ibauma -

Looks like a much degraded
phase of *Diospyros* - *Ardisia*
forest with *Pouteria*
unusually common.

Probably has suffered
a light burning judging
from number of half dead
trees.

Trees seen in hasty
examination

Diospyros mandina

Ardisia

Pouteria ferruginea

Rabbiolepis

Ficus - ribbed fruit.

Garcinia speciosa

Rhus

Fraxinus

Ficus retusa

Neolitsea

Sp. lod. pinn. comp. with follicles,
all. like *Carya*

Ficus - cauliflorous

Elaeocarpus japonicus

Arenca

Ficus sp. (subcordate)

rema

Wendlandia

Pinus lucubrensis

Diatrylium

Diospyros ferrea - large

Ficus ~~virgata~~ (small sp.)

Quercus cuspidata

scattered ~~large trees~~ (large trees)

Cerbera

Mallotus paniculatus

Ficus (dark fruit)

Laurus

Mallotus philippinensis

Morus

This forest may be a degraded oak forest, or the oaks may be just sporadic this low. This altitude, that of the highest part of the road, would seem to be about the present lowest extreme of the oak forest.

The few areas of grass here are *Imperata*, but to the south, where there is a secondary scrubby mixture there is *Miscanthus* in openings.

Nosoko area has remnants of a tall *Ficus* forest along stream and even on post-Miocene limestone.

South of Nosoko a large mangrove swamp has mainly *Rhizophora* about 3-4 m. tall with around edges some *Bruguiera* and *Excoecaria*. *Thespesia* + *Pandanus* + *Scaevola*.

July 22 1 km. s.w. of
Nasoko-Ishii Sabi

38060

Symplocos ~~hutchinsii~~ *Hayata*

#8

rare in degraded forest
on steep slope

July 22 1 km. s. of Nasoko
on Fubido gawa

6

61

Bischofia javanica Bl. ^{ex}
in roadside thicket

4

62

Excoecaria agallocha L.
common in
edge of mangrove swamp

5

63

Thespesia populnea (L.) Sol. ^{ex} _{Correa}
common in edge of mangrove
swamp

July 22 - near waterfall
1 km. s.w. of Yonohara

6

64

Mallotus paniculatus (Lam.) ^{ex}
common in roadside
thickets

tree 6 m. tall, fruits
immature.

5 m.

small tree; fruit
brown.

0 m.

small tree 5 m. tall,
lactiferous.

0 m.

small tree 4 m. tall,
flowers closed in
afternoon, reddish.
(note involueral bracts)

of Ara Kawa,

M.-A.

small tree 5 m. tall.

5 m.

July 23 -

(233)
(Photo
950-110)

Low scrubby forest on
high point on schist
ridge - ~~some~~ *Quercus*,
much *Ardisia*, some
Dendropanax, *Lauraceae*,
etc.

Ferns rather abundant,
some epiphytes - orchids, etc.

Ground cover of ferns
and several herbs,
seedlings, etc. *Alpinia*

Undergrowth thin
Psychotria, *Rhododendron* (?)
+ several other shrubs &
saplings.

(234)

Main divide - scrub
forest about 6 m. tall,
occasional taller trees

Ficus virgata

Pouteria

Dendropanax

Lauraceae - several

Viburnum

Ficus retusa

Schefflera

Cinnamomum

Ardisia

Styrax

Camellia

Podocarpus

Small
shrub

The upper slopes
are strongly wind-
sheared, and with
conspicuous grooves
6-8 m. apart. These
grooves are doubtless
due to wind, as there
is absolutely nothing
to correspond with them
below the canopy.

Tangled with *Freyrinetia*
~~Schefflera~~ ^{and some} *Smilax*. Thin
undergrowth of various
shrubs, incl. *Sarcandra*,
Psychotria, *Neolitsea*? etc.
Little or no *Quercus*.
Spacing of trees
1-3 m. Canopy
fairly complete.

Ground cover of
ferns, rather sparse.

This ridge rather
broad and flat topped.

At the edges the scrub
is much more depressed
from wind shearing.

Much more densely
tangled with *Freyrinetia*-
etc. Grooves very
prominent here.

Ground cover of *Ligularia*,
etc.

(to p. 168)

July 23 -

near of Tomino

lowland thickets and
marshy ground

(737)

38065

Coccoloba lachrymans-jobi L.

rare in open wet ground

66

Barringtonia ~~201000~~ (L.) Bl.

common along tidal stream

2 67

Callicarpa japonica var. *lucida* P. H. R.

on rough limestone

5 68

Antidesma ~~portulacastrum~~ (var. *barbatum*) (P. H. R.)

on rough limestone

3 69

Artemisia vulgaris L.

common on road fill

7 70

Arenca tremula (Blanco) Becc.

common on rough limestone

A. anglica Becc. det H. E. S. 7000

3 71

Ficus virgata Reinw.

common on rough limestone

1 72

Terminalia ~~catappa~~ L.

in thicket on rough limestone

2 73

Bauhinia ~~japonica~~ Maxim.

climbing in thicket on rough limestone

2 m.

A. 1 m.

caespitose, 1 m. tall.

1 m.

small tree 6 m. tall,
racemes pendent,
flowers pinkish white,
immature fruit square
in cross section.

4 m.

scandent shrub,
flowers whitish.Mem. 3
1 m. tallshrub 2 m. tall; fruit
black when ripe,
pleasantly acid.

2 m.

aromatic herb 1 m. tall,
branched.

4 m.

caespitose, stems
2 m. tall, leafy all
the way to base;
upper leaves reduced,
fruiting panicle
somewhat nodding,
ripe fruit bright red,
most of those in cluster
not ripe yet.

6 m.

small tree, sterile.

vine

Westward along
ridge forest much
higher - wetter
luxuriant ferns.
several Livistons.

(235)
(Photo
950-59)

Down the north slope
the forest is very wet
and luxuriant - filmy
ferns and many others,
ground orchids and
begonias.

at about 150 m. the
forest changes - becomes
drier and Ficus becomes
most abundant, oaks
disappear. Arenga
becomes very common.

(236)
petioles
on young
plants
5-3 m.
spiny
only at
extreme
base.

Near the bottom
in a broad ravine
is a grove of Livistons.
Bischofia + Macaranga
Some palms very tall, trunk 10 m.
Much logging
on all of this slope.

Livistons - "kuba" (ya)

Arenga - "mani" (y)

237

Lowland forest on
limestone - principally
Ficus

July 23 - high slopes of Takama
above Tomino, 1.5 km. w. of
~~Mosoum Lake~~ Hora Lake
in steep wet wooded slope

38074 *Lasianthus* *nigrescens* Macram
common in undergrowth

3 75 *Asplenium* *unilaterale* Lam.
on moist rocks in ravine

76 *Begonia* *laciniata* var. *formosana* Hayata
in dense shade

77 *Trichomanes* *auriculatum* Bl. det. L. V. 1956
on rocks in dense shade

78 orchid) *Gastrophysa rubicunda* Lindl. det. L. H. 1956
terrestrial in deep shade

79 (rub.) *Manodendron tinctoria* (Roxb.) B. B.
rare

80 *Polypodium* *buergerianum* Miq.
climbing on tree trunks

Sarahama Yama,
July 23 - main divide
of island, 1-1.5 km. w. of
~~Mosoum Lake~~ Hora Lake
broad wooded ridge,
schist soil.

81 (rub.) *Trichosanthes miyagii* Hayata

82 *Ilex* *integrifolia* Thunb.

in dense scrub at top of slope

83 *Freyrinetia* *formosana* Hemsl.
abundant

84

common

85 *Pouteria* *obovata* (P. R.) B. B.
common

shrub, fruit immature.

scapes and petioles
fleshy, ascending to
erect, flowers pink.

perianth dull orange,
column pale yellow
vine climbing in tree
flowers white.
rhizome closely appressed
to tree trunks.

81 woody vine, flowers white

82 shrub 2.5 m. tall;

fruit immature
climbing in trees

84 tree 8 m. tall, sterile.

85 tree 6 m. tall, leaves
glaucous beneath; fruit immature.

172

1956

Ryukyu Is.

38086

Berchemia ~~*racemosa*~~ S. & Z.

5

rare

July 23 - Basata Yama

in scrubby forest

(233)

5

37

Ainsliaea chinensis Hayata
abundant locally

2

38

(orchid) *gastrochilus japonicus* (Miq.) S. & Z.
rare, epiphytic on *Quercus*

5

39

Quercus cuspidata Thunb.
common*Castanopsis cuspidata* (Thunb.) Schottky

ISHIGAKI ISLAND,

173

vine climbing in trees,
flowers greenish white.

260 m.

flower yellow, red spotted
within, fading red.
tree 10 m. tall, fruit
immature.

1956 Ryukyu Is.

July 26 - Ishigaki Island
trip by boat up east
coast and around
island from Ishigaki
City - start 7:30 a.m.

Brown bell-shaped
medusae in water in
harbor.

Small rock just
east of harbor, 200 m.
offshore covered by
Boerhaavia, *Lepturus* and
Ischaemum.

Shore, Ishigaki to
~~Hirara~~ covered by dense
littoral scrub on very
low undercut limestone
cliffs. Then a stretch
of about 0.4 km. of beach
with scrub on beach
ridge. Then perhaps
0.3 km. of similar low
cliffs with scrub. This
very depressed at margin,
higher slightly back.
Then beach almost to
Ohama point, backed
by a scrub-covered ridge
except opposite Ohama.
Cliffs and littoral
forest around Ohama point.

Ishigaki

From Miyara point
around to opposite the
beginning of Shirahe
are alternating stretches
of beach with short
stretches of low cliffs,
with almost continuous
littoral scrub.

Opposite Shirahe is
a long stretch of beach
with boulders scattered
along inner edge of
reef flat. Back of
this is broken scrubby
forest, largely of *Casuarina*.
From Shirahe northward
for 1 km. or so is a clear
beach backed by a
scrub-covered beach
ridge. The end of this
beach near Shirahe
is of pebbles (or cobbles),
the rest is mostly sand.

South of mouth of the
Todoroki gawa are a
couple of short stretches
of low, undercut cliffs,
separated by a stretch
of rather high sand
beach. Scrub back
of all of this. At the
mouth of the Todoroki
the cliff is broken into
many discrete flat-topped

segments or rocks.

From here north is a long clear beach, backed by a high beach ridge covered by scrub or low littoral forest, to beyond the schist hills. Here it is interrupted by several large outcrops of schist rocks, scattered over a half km. or so.

July 26 - north end of island - 4 schist peaks. Examined next to last one. Grassy slopes, mostly *Imperata* with usual associates. Rocky top has dwarf shrubby depressed vegetation of *Croton*, *Ficus*, *Glochidion*, *Amilata*, *Rubus*, *Rosa*, *Carmona* (a), *Psidium*, *Eurya*, *Ardisia*, *Paederia*, *Dianella*.

July 26 - Hirakubo Beach ridge north from village to mouth of estuary.

The beach is abundantly interrupted by undercut remnants of rough limestone. The ridge has dense low littoral scrub forest of *Pandanus*, *Scaevola*, *Premna*, *Thespesia*, *Hibiscus*, *Ligustrum*, *Messerschmidia*, *Rapanea*, *Pittosporum*, *Hernandia*, *Porteria*.

The estuary has *Rhizophora*, *Thespesia*, *Excoecaria*, *Pandanus*.

The open flat to the front of the scrub has *Spinifex*, *Sporobolus littoralis*, *Euphorbia chamoissonis*, *Lippia*, *Lepturus*, *Cassytha*, *Vitex*, *Scaevola*, *Thuarea*, *Ischaemum*.

1956

July 26 - continuation
of trip around island.

From just south of the
n.w. point to the west point
(Dachs Lake) the beach
is thickly beset with
undercut limestone remnants.
There are only about 3
short stretches free of
them. The reef is about
1.6¹⁸m. high. Below it is
rather abraded, the rough
pitting somewhat smoothed
down. Above it is quite rough.
There are a few neritids but
not many. A few limpets
and other snails, also.

The areas that were
noted as burned on first
visit to area south of
Hirakubo have turned from
black to rather light brown.

Between the first headland
south of Ibaruma on the
west coast and the
area ~~south~~ west of
Kabira there are scarcely
any ~~of~~ areas where
grass runs very much
up the steep slopes, as

it does so conspicuously
north of there and on
the other coasts.

On the volcanic knobs
on the end of Kabira
peninsula the cycads
are exceptionally dense
on the seaward sides,
on the upper slopes.
The lower slopes are
grassy.

On the very steep seaward
side of the ridge back
of Ogan Zaki is a thick
scrub forest with
what appears to be an
unusual proportion of
 Garcinia speciosa.
This wood probably
secondary, is very conspic-
uously wind-sheared and
wind grooved.

1956 Ryukyu Is.

Juba Gawa,
July 26. 0.7 km. n. of
Hirakuboon sand ~~beach~~ ridge
back of beach38090 *Hernandia sonora* L. ^{OK}

2 common in littoral forest

2 91 *Ligustrum* ^{*corianthus zanzibaricus* (Thunb.) aff.}
occasional in littoral forest42 *Hedyotis*

common on

2 92 *Berchemia* ^{*linearis* De}
local in open places^{*Phyllanthus* (L.) Thunb.}2 93 *Rhipis nodiflora* L.
common in open places2 94 *Hedyotis*
on rough pitted limestone
remnant.4 94a *Eurychorda* ^{*infracta* Thunb.}
in littoral forestJuly 26 - near Hirakubo lagoon,
north end of island
on rough pitted limestone
remnants2 95 *Sedum formosum* N. E. Ba.
very local ^{det. R. Moran}

1 96 (asclep.)

uncommon

4 97 *Clematis* ^{*grata* var. *ryukyuensis* Tamura}
common3 98 *Hedyotis*
common3 99 *Raphiolepis* ^{*riukyuensis* (H. & G.) Makino}
common4 100 *Ficus* ^{*vernalis* L.}
local

2 m.

small tree 5 m. tall,

small tree; sterile.

prostrate, forming
a close mat; flowers
dried, apparently abortive.
prostrateprostrate; leaves sub-fleshy,
flowers white.shrub 3.5 m. tall, flowers
yellow-green.

5-10 m.

164

fleshy, fruit ~~immature~~ ^{immature} ~~scale~~ dry.twine, flowers
pale green; fruit immature.
vine, tangled in
bushes.prostrate, leaves scarcely
fleshy.

shrub; fruit immature.

depressed shrub; sterile.

1956 Ryukyu Is.

same ^{open rocky} - summit of
crucial hill of schist.

38101

Eurya

4

rare

~~on sparse~~

4

02

(comp.) *Carpesium cernuum* L.
common

#

same - among schist boulders

1

03

(det.) *Ajuga pyramidea* A. Gray

rare, almost dried up.

#

same - on grassy plain
at foot of schist hill

2

04

Lespedeza cuneata G. Don
frequent

3

05

Fimbristylis

common

1

06

Chrysopsis aciculatus (Retz.) Don
rare

1

07

Sporobolus elongatus R. Br.
occasionalsame - in patch of littoral
forest on beach

2

08

Morus australis Poir. var. (probably)
occasional

80 m.

low stiff bush; fruit
immature.

heads nodding.

50 m.

prostrate, sterile.

40 m.

erect, branched at base,
spreading by slender
rhizomes.

A. change

culm ascending.

A. change

culms ascending

1 m.

small tree, sterile.

1956 Ryukyu Is.

July 27 - YCAT Compound

Quamoclit pennata (Desroux.) Bojer

38109

Ipomoea quamoclit L.
cultivatedJuly 28 - Agricultural Experimental
Station, north of Ishigaki City

5

10

Acalypha ~~godseffiana~~ ^{marginalis} (Poir.) Spreng.
cultivated, being propagated
in large numbers

July 28. 10. of YCAT

toward Komanzaki

- large chest outcrops

Partially scrub
covered. Flora:f *Premna obtusifolia*f *Carmona retusa*f *Bauhinia*f *Ficus virgata*f *F. retusa*f *F. wightiana*f *Clematis*c *Murraya paniculata*o *Pittosporum tobira*~ *Imperata cylindrica*c *Polypodium scolopendria*o *Miscanthus floridulus*~ *Psilotum nudum*c *Hibiscus tiliaceus*~ *Commelina*~ *Mourea citrifolia*c *Anaplois*1 km. 100
of Naga Saki
1 m.twining, flowers deep
crimson red.

70 m

shrub 2 m. tall, leaves
coppery bronze, edged
with white.~ *Arundo donax*~ *Clerodendrum inae*Seaside rocks of ~~old~~
Paleozoic breccia or
conglomerate -The high tide level
community here is
of *Zoysia tenuifolia**Panicum arbusculum**Sporobolus virginicus*?*Descurainia portulacastrum*

+ the prostrate legume

found on Ogasaki.

Possibly *Hedyotis*
but on a rock out in
the sea which could
not be reached.

July 29 Kannon Shrine

This shrine grove is mostly pine but with many *Calophyllum* around the building, not especially large trees. A coconut tree has some nuts.

Smaller trees of *Todocarpus*, *Casuarina*, *Cordia*, and some bananas planted around buildings, as well as some herbaceous ornamentals

Zinnia

Caesalpinia pulcherrima

Gomphrena globosa

Alternanthera versicolor Roz.

July 28 east of ~~Kannon Lake~~ ^{Fu Sakai}

38111 *Clematis viscosa* L. ^{ok}

locally abundant in cultivated field

4 - 12

~~*Thespesia japonica*~~ ^{*Aplousa mutica* L.}
local in grassy areas

July 29 - Ishi Lake, 0.5 km. S. of

6 13

Bridelia ^{*ovata* Decaisne}
scrub forest on summit of dissected hard limestone peak

5 m.

flowers yellow.

^{or}
A. class

rhizomes branching, above ground on stilt roots, culms ascending.

Banna Lake

100 m.

shrub or small tree; fruits black when ripe.

1946

July 29 - Ishi Loke
 peak of fantastically
 dissected limestone,
 cut and channelled
 into jagged pinnacles
 and chasms, with
 large flutings on
 sides.

Vegetation principally
 Ficus, with Diospyros
 Mallotus, etc.

Dense scrubby forest
 but with some bare
 slopes.

- a Ficus retusa
- a F. wightiana
- a F. virens
- c F. erecta
- c Conocarpus ferrugineus
- f Diospyros maritime
- c Arundo donax
- c Mallotus philippinensis
- ~ Bruguiera
- ~ Garcinia spicata
- a Brenga tremula
- c Nephrolepis (falcata pinnatis)
- c Premna obtusifolia
- o Morus
- a Pterocarpus?
- Glomidium
- lq Pisonia aculeata
- a P. umbellata

la. apocynaceous scandent
 shrub

Cassia

Pipturus

Broussonetia papyrifera

Ardisia

Flagellaria indica

Hoya carnosa

Asplenium nidus

July 30 - YCAT Compound

- along top of beach
 38114 *Sporobolus pectinatus* v. *brasilianus*
 3 abundant on lime sand
I. pectinatus (L.) Swartz

- 2 15 *Vigna marina* (Burm.) Merr.
 common

- 2 16 *Calophyllum inophyllum*
 occasional

July 31 - ~~bet. ^{0.5 km. s. of} ~~Shirahama~~ and~~
 Todoroki Gawa.

- 3 17 *Cyperus revolutus* Thunb.
 in scrub vegetation
 on limestone

beach in front west of
 Aug. 1 - YCAT Compound, 1 km.
 1 18 *Morus australis* Poir.
 in beach scrub

- 2 19 *Thalassia hemprichii* (Ehrenb.) Aschers
 1 20 *Syringodium isoetifolia* (Kütz.) Bandy
 2 21 *Halimeda*
 3 22 *Codium*

1 km. w. of
 Naga Lake

1 m.

prostrate, forming
 large mats, flowering
 scapes erect, corolla
~~mauve~~ rose purple
 with 5 deeper stripes
 in throat, stigma
 capitate, white.
 prostrate, forming
 mats.

L. 1 m.

small tree, sterile.

15 m.

caespitose, thick stems
 covered by leaf bases,
 rosettes of spreading
 leaves, surrounding
 hemispherical mass
 of incurved fruiting carpels.
 seeds orange red.

w. of
 Naga Lake
 1 m.

shrub 1.5 m. tall, with
 only new leaves on
 fruiting branches

0 m.

det. C. den
 Hartog 1969

leaveterete

Aug. 1-2 - Ishigaki Island -
Typhoon "Wanda" -
Strong winds started
July 31 but did not
reach any marked
intensity until the
morning of Aug. 1 when
during the forenoon
velocities of ~~60 mph~~ knots
were recorded by the
Ishigaki weather station.

Some examination was
made of the coastal scrub
vegetation along the beach
west of VCAT compound
during the height of
the wind, 11-12 a.m. Little
perceptible effect was
seen except a sort of
water-soaking of leaves
of *Scaevola*, *Ipomoea*,
Clerodendrum and *Vigna*.

The sand was washed
out from the seaward
side of the vegetated berm
leaving the *Ipomoea pes-caprae*,
Vigna marina and *Ischaemum*
at the mercy of the wind.

The wind slackened some
later in the day and a
visit was made to Kannon
Lake. Here there was
little effect except some
browning of leaves and

similar waterlogging
where leaves were
exposed to driven salt
spray.

A strong, ^{mostly} dry wind
blew during the night
and all day Aug. 2. An
examination was made
from 3-5 p.m. ~~from~~
~~data~~ along the beach
near the compound and
from Ishigaki City to
the Yanabu Estuary and
back inland along
the road behind Banna
Dake to Ishigaki.

Where there was
direct exposure to the
sea almost all the
leaves had turned brown.
Pandanus seemed unaffected
and *Scaevola* less so
than most. Inland the
only visible effects were
many banana plants
knocked down, some
sugar cane knocked
down, a few branches
broken off *Comarostaphylos* trees,
and general almost complete
defoliation of *Leucaena glauca*.
Around VCAT a few branches
~~were~~ along the coast *Pandanus*, *Calliophyllum*,
Casuarina, ^{*Scaevola*} and *Acacia retusa*
suffered least.

Clerodendrum inerme seemed hit hardest, but *Hibiscus tiliaceus*, *Vitex*, ~~*Portulaca*~~, *Premna*, *Scaevola*, *Ischaemum muticum*, *Ipomoea pes-caprae*, *Vigna marina*, *Morus australis*, *Leucaena glauca*, *Vitex rotundifolia*, *Euphorbia charissonae*, *Wedelia biflora*, *Sambucus*, *Euphorbia heterophylla* all suffered browning of leaves and twigs.

Great quantities of *Thalassia*, *Codium* sp., *Turbinaria*, *Sargassum* and *Halimeda opuntia* were thrown up on the beach.

In town the *Morus* suffered a considerable browning of leaves. the *Garcinia* not at all.

Upper end on limestone has also *Vitex*, *Clerodendrum*, *Mallothus (glauca)*, *Melia*, *Psidium*.

Aug. 4 - Mirra Valley, e. side.

Ravine cut in fine bedded gravel, with partially cemented to conglomerate, overlain by post-miocene limestone. Beds of iron cement in the gravel.

Below it ravine forest -
Ficus virgata
F. wrightiana
F. retusa *F. kingiana?*
Cyathus *F. erecta*
Pandanus *F. (cauliflora)*
Ardisia
Arenca
Schefflera
Gardenia
Angiopteris
many other ferns
Erodia
Distylium
Clerodendrum, *Callicarpa*
Flagellaria
Piper
Toddalia
Alpinia speciosa
Elaeagnus *Maesa*
Rhus
Claoxypus japonicus
Glochidion hongkongense

Aug. 4 - upper Vagaya V.

Erosion scar on schist
and gravel

Sphenomeris

Gleichenia

Equisetum

Bledium

Lycopodium cernuum

Psidium

Distylium (or *Lynophora*)

Miscanthus

Rhynchospora rubra

Osbeckia

Rosa

Andropogon

Cinnamomum camphora

Ficus erecta

Imperata

small *Andropogoneae*

Gravelly clay terrace
near peat bog -

Typical soil sequence
(acc. Stensland) is top 18-24"
fine reddish clay, next
few inches a layer of
clay with abundant
small quartz pebbles,
then thick layer (many feet)
of generally clay material
with miscellaneous
angular fragments, mostly

small but many
very large, but very
poorly sorted, unbedded.
Beneath this, a thick
layer of yellow silty
sand, then fossiliferous
gray clay.

Topographically
below this is a somewhat
similar material
showing limestone influence.

The non-limestone
one is grass-covered.

The other is cultivated.

Aug. 4 - Miyara

38123 *Portulaca oleracea* L.
bare limestone in road cut and around monument.
roadside ditch

5 24 *Boerhaavia mutabilis* R. Br.
common

3 25 *Portulaca pilosa* L.
common, seen only here.

Aug. 4 - 1 km. n.n.e. of
Kawakura, about 5 km. n. of Miyara
in erosion scar on thin
gravelly sediments on low
schist knoll.

5 26 *Blechnum orientale* L.
common

9 27 *Sphenomeris chinensis* (L.) Maxon
~~very common~~ abundant

6 28 *Cymbopogon tortilis* (Presl) A. Camus
~~very common~~
very common

Aug. 5 - Shira Mizu, upper Nagura Valley

1 29 *Echinochloa crusgalli* (L.) Beauv.
edge of rice field

3 30 *Angiostemum erectum*
in wooded ravine.
A. suboppositifolia W. H. de Vries

2 31 *Bridelia ovata* Desne.
in wooded ravine

2 32 *Melia azederach* L.
banks of wooded ravine

Aug. 5 YCAT compound 1 km. w. of Naga City

2 33 *Ischaemum muticum* L.
edge of thicket on sand flat back of beach

15 m.

cut and around monument.
depressed, fleshy.

prostrate, leaves pale
beneath; flowers white.
prostrate, fleshy;
flowers crimson-magenta.

40 m.

culm erect, caespitose.

35 m.

OK
A. Chase

rhizome barrel shape, covered by
stipulate leaf bases; fronds
3-4 m. long, arching, joints fleshy.
sterile shrub 3 m. tall,
leaves somewhat glaucous beneath.
small tree; fruit green.

OK

Laki 1 m.
City

OK
A. Chase

Aug. 5 - YCAT and
 Ishigaki City -
 salt damage to
 various plants is
 showing up more
 clearly now. The Casuarina
 which showed little or
 no effect right after
 the typhoon shows a
 considerable browning
 now. Calophyllum
 likewise. Leucaena leaves
 and twigs are dead as
 though singed. Ficus
 wightiana is losing
 its leaves in great
 quantities. The Morus
 in Ishigaki City streets
 has largely lost the
 brown leaves. Seems to be
 bursting into flower now.

Aug. 6 YCAT compound, 1 km.
 w. of Naga Saki

Morus australis var. glabra Koidz.
 planted

1 m.

small tree; completely defoliated
 after exposure to salt spray
 during typhoon, bursting into
 flower within 5 days after
 typhoon.



